Environmental Assessment
Construction and Operation of a Live Fire, Maneuver Range

Pinon Canyon Maneuver Site, Colorado

Headquarters 7th Infantry Division & Fort Carson
Directorate of Environmental Compliance & Management

ENVIRONMENTAL ASSESSMENT

Construction and Operation of Live Fire, Maneuver Range
Pinon Canyon Maneuver Site, Colorado

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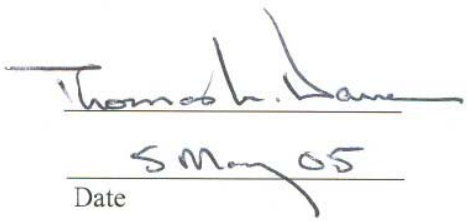

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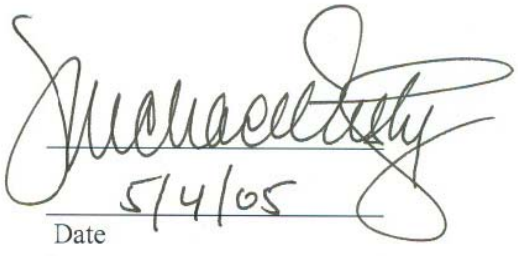

[1] Signatures are digital copies of originals, which are on file.

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1.0 PURPOSE, NEED, AND SCOPING

1.1 Introduction

The 7th Infantry Division and Fort Carson (hereinafter called Fort Carson) is proposing to construct and operate a live fire, maneuver range at Piñon Canyon Maneuver Site (PCMS) located in Las Animas County, Colorado. Convoy operations training utilizing a live fire component would take place on the range. Fort Carson has developed standardized training procedures for convoy operations, compiled in the April 2004 7th Infantry Division *Convoy Live Fire Exercise Handbook/Standard Operating Procedures*. This section presents the purpose and need for the Proposed Action; defines the scope of the environmental analysis and issues to be considered; identifies decisions to be made; and identifies other relevant documents and actions.

The increased accuracy and lethality of current and emerging weapon systems require the development of live fire ranges that allow soldiers to engage targets at the maximum effective range of the weapon system. By developing the PCMS to include a live fire maneuver area capable of supporting the tactical operations of a Special Forces battalion in both urban and rural terrain, and a battalion task force level attack (900-1,200 soldiers), live fire operations above the section or platoon level (less than 20 soldiers) become possible. Soldiers are afforded the opportunity to use their weapon systems in synchronization with company and battalion size maneuver as part of the combined arms team, i.e. different components such as tanks, helicopters, and wheeled vehicles training together in one exercise. Training soldiers to fire and maneuver under live conditions instills the confidence necessary to succeed in battle. Units deployed to PCMS need this live fire training prior to deployment and as a part of all combat training.

The National Environmental Policy Act (NEPA) of 1969, as amended, requires federal agencies to consider environmental consequences in their decision-making process. The President's Council on Environmental Quality issued regulations to implement NEPA that include provisions for both the content and procedural aspects of the required environmental analysis. The Army has prepared this environmental assessment adhering to procedures set forth in Council on Environmental Quality regulations (40 CFR Sections 1500-1508) and 32 CFR Section 651 (*Army Regulation 200-2, Environmental Analysis of Army Actions, Federal Register Vol. 67, No. 61, March 29, 2002*).

These federal regulations establish both the administrative process and substantive scope of the environmental impact evaluation, designed to ensure deciding authorities have a proper understanding of the potential environmental consequences of a contemplated course of action. This environmental assessment will facilitate decision-makers in making environmentally informed decisions regarding the proposed construction and operation of the live fire maneuver range.

Continuing resource stewardship in accordance with the spirit of the existing PCMS Environmental Impact Statement (*Final Environmental Impact Statement for Acquisition of Training Land in Huerfano, Las Animas and Pueblo Counties, Colorado* (U.S. Department of the Army 1980) will greatly enhance the long-range sustainability of these lands for future training and Army missions. However, the nature of and the conditions requiring those mission have changed since that

Environmental Impact Statement was approved and will likely continue to change. Those changes have received and will receive proper environmental analysis, such as this Environmental Assessment.

1.2 Introduction of Small Arms Live Fire Operations at PCMS

The *Environmental Assessment for the Construction/Operation of Firing Ranges and Other Training Facilities, Pinon Canyon Maneuver Site, Colorado* (Gene Stout and Associates 2004) analyzed the introduction of small arms live fire operations at PCMS and discussed the purpose and need for static (non-maneuver), small arms live fire ranges there. That environmental assessment discussed information on Fort Carson's changing mission that determined that firing ranges at PCMS are necessary to help relieve the overload on facilities at Fort Carson. Additionally, the new ranges would provide an anticipated capability to deploy units directly from training at PCMS to real world missions.

A pistol, machine gun, grenade launcher, and two zero sighting rifle ranges were constructed in 2004 and are now operational. As discussed in the January 2004 environmental assessment, the need for small arms, live fire ranges at the PCMS is summarized in the following paragraphs to provide background and give the reader a better understanding of the purpose and need for an additional live fire range.

Since the initiation of training at PCMS in 1985, Fort Carson's weapons ranges and training areas have been used for individual and crew-served weapons qualification and training and for small-unit training. PCMS has been used mainly for large-unit maneuver training and exercises.

In the past 20 years since the PCMS began operations, the historic trend has continued. However, the distance that weapons systems can fire has increased, as have the mobility and required area of operations of various military units. The result has been that, even with no increase in the number of units for which Fort Carson has training responsibility or changes in missions, the demand for training space has increased. However, Fort Carson missions and the number of units and personnel for which it has training responsibility have increased dramatically, especially in recent years.

At present, the installation houses four main military units:

- the 3rd Armored Cavalry Regiment, which is essentially a self-contained, heavy combat unit of about 5,200 soldiers, with both ground and helicopter forces;
- the 3rd Brigade Combat Team, which is a mechanized infantry brigade of over 3,000 soldiers, augmented with a number of support units to allow it to operate independently from the main part of its parent organization, the 4th Infantry Division (Mechanized) at Fort Hood, Texas;
- the 43rd Area Support Group, whose integral units can provide a variety of support services including a combat support hospital, combat engineer services, transportation, maintenance, and military police; and
- the 10th Special Forces Group (Airborne) deploys special forces troops utilizing the wide variety of skills required of such troops, such as language capability, parachuting, scuba diving, skiing, and so on, in addition to highly refined basic combat capabilities.

During a "normal" year, approximately 10,000 soldiers, 650 tracked vehicles, and 800 wheeled vehicles from these assigned major units conduct training at PCMS. Another unit, the 2nd Brigade, 2nd Infantry Division will be stationed at Fort Carson in summer 2005.

In addition to assigned units, Fort Carson provides training support assistance and training evaluation oversight to 104 Reserve Component units annually. Much of this training must be conducted on Fort

Carson, and it generally occurs mainly between May and August, forcing assigned units to rely on the PCMS for training during this time.

In June 1999 Fort Carson became home to the 7th Infantry Division, which is composed primarily of three Reserve Component enhanced separate infantry brigades (eSB), one each from Oregon (41st), Arkansas (39th), and Oklahoma (45th). In "normal times," these brigades of over 3,000 soldiers each are required to perform two-week Validation Annual Training in preparation for deploying to Combat Training Centers in California or Louisiana. Although these brigades have usually conducted validation training at their home stations, but in 2004, the 41st eSB conducted that training to PCMS. The small arms ranges at PCMS enhance PCMS facilities to support such Validation Annual Training should it occur in the future.

In July 2001 the 3rd Brigade Combat Team of the 4th Infantry Division became part of the Army's Division Ready Brigade Cycle, under which it is periodically put on alert to be able to deploy on short notice for real world missions. Training requirements for this unit increase as it nears and is in its alert cycle.

Fort Carson units, as part of an Army-wide program, will be "transforming" into more, smaller units to improve unit capability to meet requirements for rapid deployment of highly mobile units to respond to worldwide threats. This process would increase demand for already limited training facilities.

Finally, world events have dramatically increased and changed both present and anticipated demands on PCMS and Fort Carson. The Global War on Terrorism will continue; the war in Iraq and removal of the Taliban regime in Afghanistan have increased deployments on a consistent scale. Rotations to these areas, and possibly others in the future, have placed demands on the military and training resources that were never anticipated only a few years ago. Between September 11, 2001 and October 2004, Fort Carson has mobilized over 30,000 Active and Reserve Component soldiers with another nearly 9,000 anticipated to be mobilized by October 2005. This mobilization includes ensuring that they are trained, equipped, and supplied for deployment around the world. Depending on timing of deployments, these mobilizing soldiers could be competing with some or all of the units assigned to Fort Carson for training resources.

1.3 Purpose and Need for the Proposed Action, a Live Fire, Maneuver Range

"*The leading cause of American Soldier casualties in Iraq today is ambush and/or IED (Improvised Explosive Devices), both initiated during convoy operations*."[2] The purpose of the Proposed Action is to allow Fort Carson's soldiers to experience the most realistic convoy operations training available. Convoy operations training would include firing at targets from roads and advancing/firing on targets from roadways (maneuver).

There are not enough adequate ranges (only Multipurpose Range Complex and Range 111) that can support convoy, live fire operations compared to the large number of soldiers (active duty, reserve and National Guard) that train, mobilize and deploy from Fort Carson. PCMS has no current capability to support live fire, convoy operations training. The live fire, maneuver range is needed to help relieve the overload on facilities at Fort Carson. Additionally, this proposed facility would allow much needed capability to deploy units directly from training at the PCMS to real world missions. Specifically, the need for the proposed action is to provide live fire maneuver training for mobilizing units or units training for combat at PCMS.

[2] Commanding General's memorandum dated 12 April 2004)

1.4 Environmental Analysis

This Environmental Assessment is a supplement to the original PCMS Land Acquisition Environmental Impact Statement (U.S. Department of the Army 1980). This Environmental Assessment analyzes effects of construction and operation of a live fire, maneuver range on PCMS to provide adequate training facilities to conduct Fort Carson's military mission to meet evolving Army training standards.

This environmental assessment considers direct, indirect, and cumulative effects of the Proposed Action and alternatives, including the No Action Alternative. It was prepared in accordance with the National Environmental Policy Act of 1969 (42 USC 4321 *et seq*.), Council on Environmental Quality Regulations (40 CFR Parts 1500-1508), and Army Regulation 200-2, *Environmental Analysis of Army Actions* (32 CFR Part 651). A specific requirement for this environmental assessment is an appraisal of effects of the proposed construction and operation of this live fire, maneuver range, including a determination of whether or not a Finding of No Significant Impact is appropriate or whether a Notice of Intent to prepare an Environmental Impact Statement is required.

The Proposed Action and its alternatives were evaluated with respect to their potential effects, both positive and negative, on soils, surface waters, biological resources, cultural resources, and socio-economic conditions at PCMS and the surrounding area. Cumulative impact discussions include the recently constructed static small arms ranges on the western boundary and any planned actions for the foreseeable future. A brief analysis of the issues eliminated from further analysis can be found in Section 4.1, *Issues Not Addressed*.

1.5 Decisions to Be Made

The decision to be made is whether the Proposed Action could cause significant impacts to the human or natural environment. The Garrison Commander, 7th ID and Fort Carson will make this decision.

1.6 Public and Agency Review and Comments Received

Public meetings were held in La Junta, CO and Trinidad, CO on February 1 and 2, 2005, respectively to obtain public input into the Proposed Action. These meetings were advertised (twice in all but one) in the following venues: Colorado Springs Gazette, Trinidad Chronicle, La Junta Tribune Democrat, Bent County Democrat, Fowler Tribune, Rocky Ford Daily Gazette, Ordway New Era, Pueblo Chieftain, and the Ag Journal Weekly. Appropriate local, state, and federal agencies (see Chapter 7, *External Agency Coordination*) were provided drafts of this Environmental Assessment for their input.

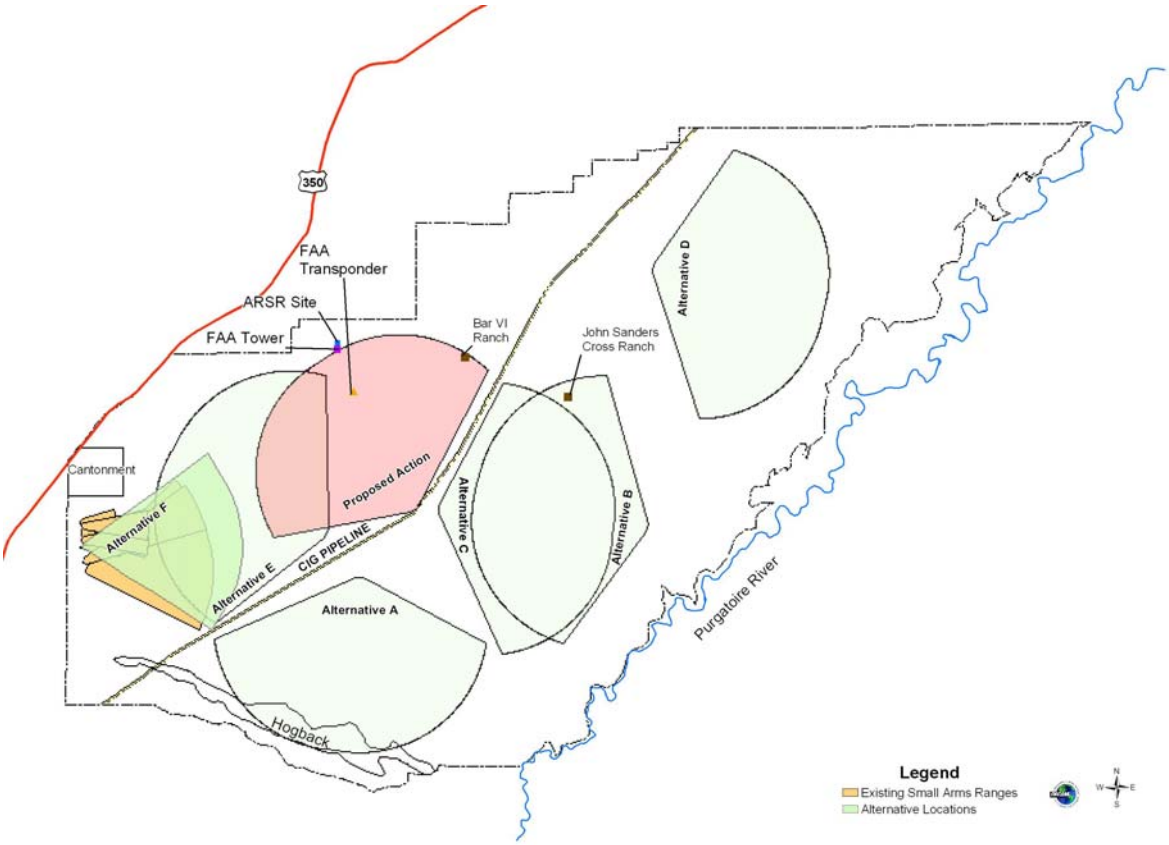
The draft Environmental Assessment and Finding of No Significant Impact were made available for public review by placing them in the following locations: Colorado Springs, Penrose Public Library; Pueblo, Pueblo City-County Library; Trinidad, Carnegie Public Library, La Junta, Woodruff Memorial Library, Rocky Ford, Rocky Ford City Library; Walsenburg, Huerfano County Public Library, and PCMS Main Administration Building. These locations were provided using notices in the above list of venues. Copies were also made available to individuals by mail. The public notice period was March 14, 2005 to April 14, 2005.

Appendix A has comments/summaries received from scoping and external review of this environmental assessment. These comments were used to improve the environmental assessment.

2. DESCRIPTION OF PROPOSED ACTION– Construction of a Live Fire, Maneuver Range

The Proposed Action would construct and operate a motorized, mechanized and dismounted maneuver live fire range at PCMS. The range would provide maneuver live fire training in an urban atmosphere or convoy attack scenario, including dangers presented by improvised explosive devices that could be hidden in cars or in debris along the road. This would occur in a teamwork situation while the troops are on the move, in vehicles or on foot, rather than at a static, small arms range where a soldier stands in one place and fires at a target. The "urban" element would be provided by emplacing removable building facades and targets along the route inside a designated range footprint. The proposed range location is the northwestern area of PCMS (Figure 2.0).

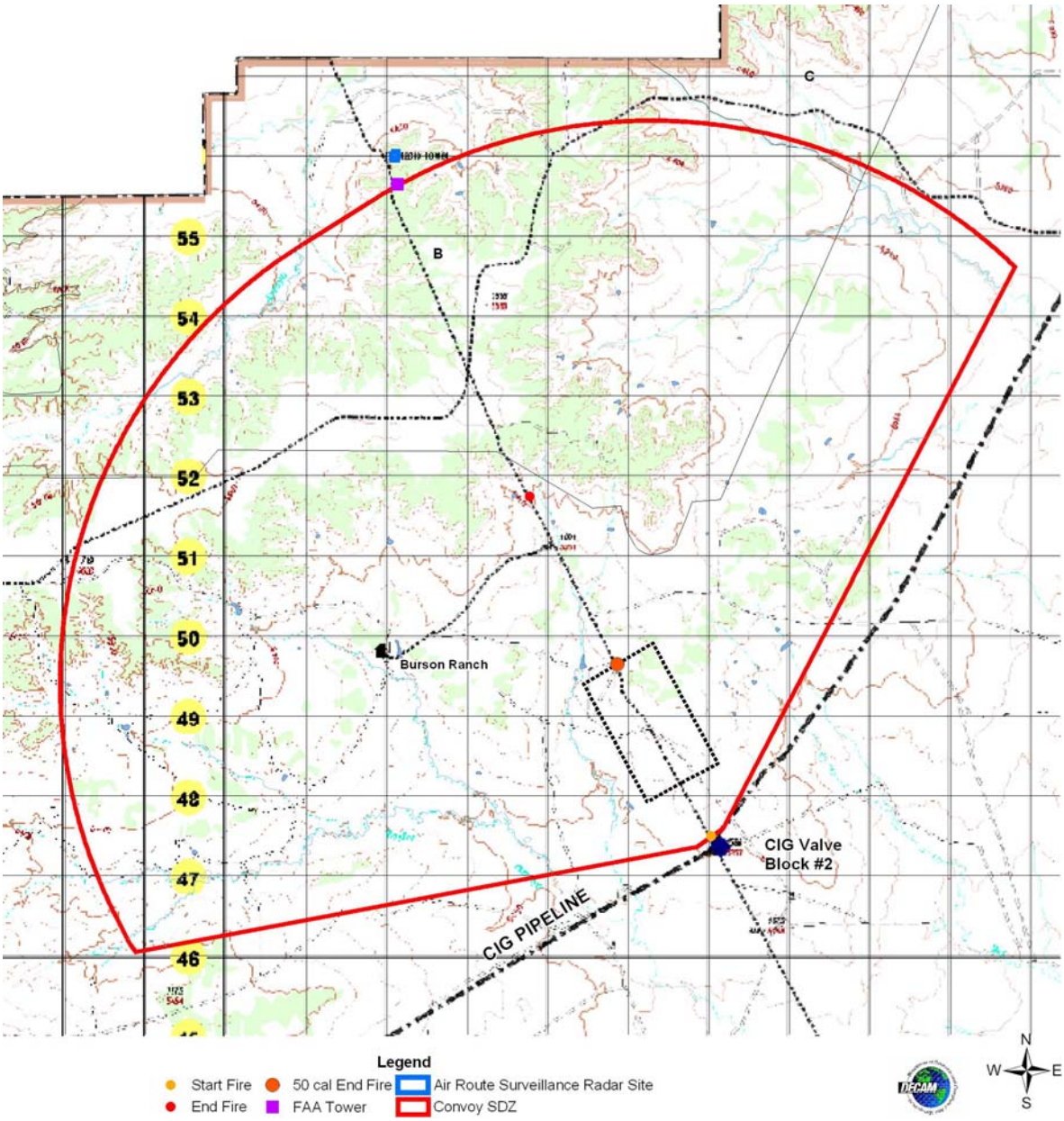
Figure 2.0. Proposed and Alternative Live Fire, Maneuver Range Sites



2.1 Range Construction.

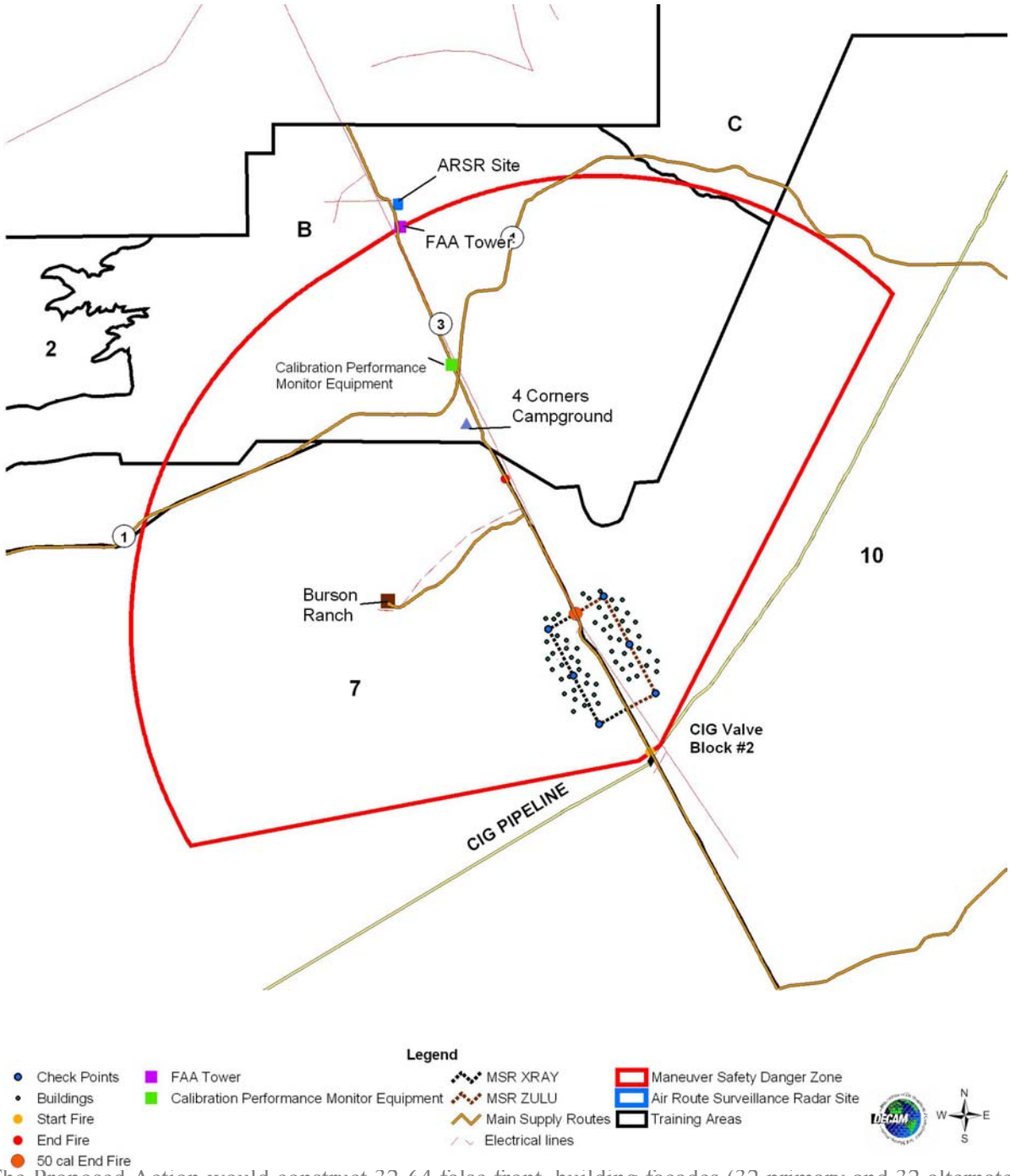
Figure 2.1a shows the proposed range with topography, drainage, and tree cover (green areas to provide a general view of the proposed range in relationship to land features. Figure 2.1b shows the proposed range, omitting background complexities, to better understand changes that will occur. Figure 2.1c is a view of the Proposed Action site from military supply route (MSR) 3, looking downrange. These figures are important to understanding below discussions.

Figure 2.1a. Topography and Hydrology of Proposed Live Fire, Maneuver Range



Two standard, military supply route (MSR)-style, 32-foot wide gravel roads (MSR Xray on the western side of MSR 3 and MSR Zulu on the eastern side of MSR 3) would be constructed as the loop of the convoy route (shown as a rectangle around MSR 3 just to the northwest of the El Paso Pipeline Company pipeline). Shoulders and shallow, wide erosion control ditches on each side would make the total width approximately 60 feet. The two roads forming the loop would be approximately 2,100 feet long (about three acres total new roads). Approximately 1,500 feet of the existing Military Supply Route 3 would be used as the main convoy route. Targets and buildings would be situated along the loop.

Figure 2.1b. Proposed Live Fire, Maneuver Range Features



The Proposed Action would construct 32-64 false front, building facades (32 primary and 32 alternate) on the existing ground surface to create small urban areas along MSR Xray and MSR Zulu. Facades would vary in size and shape and include single story and multi-story live fire-capable frames/facades, the largest being 22 feet high and 16 feet wide. No concrete flooring is proposed. Two 8-inch holes to hold the structure, with 10 stakes and guy wires, would provide stability. These facades could be removed whenever the area would need to be used for other maneuvers.

Figure 2.1c. View Downrange of Proposed Live Fire, Maneuver Range

Approximately 60 targets would be emplaced on the range near MSR Xray and MSR Zulu and in windows of buildings (for urban scenarios); these would have the capability of moving between buildings to simulate people running. These targets would be behind earthen berms inside pre-cast concrete housings to protect target mechanisms and batteries. Target berms would be permanent, seeded, and with temporary fixtures that the target lifters would go in. Berms would be approximately 3 feet high and 5 feet wide to protect concrete housings holding target lifter devices. The battery-operated lifters and concrete fixtures would be removed after each use of the range, leaving the berms. Building facades would be removed. This would allow tanks to maneuver in the area when the range is not in use. Wheeled vehicles generally do not maneuver cross-country. Removable items would be stored in the cantonment between uses.

Fifteen to 20 vehicle targets would be placed on the range (within line-of-sight as troops maneuver along MSR 3 to the "End Fire" location at the base of the hill), also behind earthen berms for protection. 16-foot wide by 4-foot high retaining walls would be constructed using railroad ties or landscape timbers to protect vehicle target mechanisms. All targets would be battery operated.

Four range safety markers (two on each side of MSR 3) would be installed; they would be lighted and heated for night or low visibility operations. Four 1,800-watt generators[3] would be placed at each of the

[3] Solar panels were considered and rejected due to the requirement for Alternating Current to operate thermal "blankets" required for thermal sights. Solar panels were rejected for target operation due to past experience with inadequate battery charging by these panels.

range markers and protected by the construction of small earthen berms with 3-foot x 3-foot retaining walls. These markers would be used for troops using the range (day or night) to know not to fire to the right of the markers on the eastern side of the MSR or to the left of the markers on the western side of the MSR. This would ensure firing is contained within the surface danger zone.

A 250 x 250-foot gravel parking area and a 20-foot high range tower would be constructed to support range operations. The approximate size of the range footprint (where building facades and targets would be located) would be 761 acres. The approximate size of the surface danger zone (this would also include the range footprint) would be 20,900 acres.

MSRs 1 and 3 would act as key containment firebreaks for the range. Most range-started fires would start south of MSR 1. In addition, a number of lesser maintained roads would serve to stop small fires and could be used as lines to start backfires to stop approaching larger fires.

Units using the range would carry firefighting equipment (slappers, backpacks, etc.) and act as first responders to fires. PCMS fire response is accomplished by personnel from the Fort Carson Fire Department, Directorate of Environmental Compliance and Management, and Directorate of Plans, Training and Mobilization.

Fort Carson is evaluating the potential to thin some trees in the northern portion of the surface danger zone. This would slow the speed of wildfire spread and improve suppression efforts. Pyrotechnics would be restricted during severe fire danger seasons.

Controlled burns will be used to reduce fuel loads and break-up the continuity of fuels, reducing the risk of large fires. Each year a specific prescribed fire plan is developed for PCMS. This planning effort will include specific burning plans for the live fire, maneuver range. Implementation of this plan includes obtaining required permits. Prescribed burning would target areas most likely to ignite due to range operations as well as areas with heavy fuel buildups.

2.2 Range Operation

The proposed range is intended for use as a maneuver live fire range. Maneuver live fire involves using both motorized and mechanized equipment currently and projected to be in the Army inventory as well as dismounted (on foot) operations (units maneuvering down a lane and engaging targets with small arms) by soldiers. Target operation and control would be accomplished via a battery operated hand-held target transmitter. All targets would be battery operated.

The proposed live fire, maneuver range at PCMS would be designed primarily to train squad- through battalion- and brigade-size troop units and Special Forces. The PCMS range would replicate what soldiers are experiencing in the global war on terror.

It is important to understand surface danger zones and airspace concepts, as both are important components of this proposed live fire, maneuver range.

Surface Danger Zone

A critical component to the training mission of the U.S. Army is ensuring the safety of troops during weapons training programs. A key factor in range safety management is the designation of surface danger zones. Surface danger zones define areas where hazards from fragments or projectiles are likely to occur. Each weapon has its own geometric definition of a surface danger zone that is further modified by specific munitions, firing conditions, and target conditions.

Officially, a surface danger zone is the area designated on the ground of a training complex (to include associated safety areas) for the vertical and lateral containment of projectiles, fragments, debris, and components resulting from the firing or detonation of weapon systems to include exploded and unexploded ordnance. More simplistically, a surface danger zone defines the area within which potential hazards exist from the firing of weapons and is generally determined by the type of weapon system/ammunition that travels the farthest distance over level ground under perfect weather and altitude conditions. The surface danger zone is bounded on the sides by the target placement, *i.e*., a soldier would not turn around and fire behind him/her because of the way the range is designed and operated. The development of surface danger zones for Army weapons systems is defined in Army Regulation 385-63.

Because the surface danger zone is the entire area of potential impact from a projectile, it usually defines the area analyzed for environmental impacts to natural and cultural resources.

Controlled Firing Area

The airspace above the proposed range can be managed/controlled under several alternatives. Fort Carson has a Federal Aviation Administration-approved Controlled Firing Area above the range (Appendix B).

A Controlled Firing Area is a designation given to the area above a firing range that is agreed upon by the Army and the Federal Aviation Administration to be managed by the Army. Fort Carson has this designation for the live fire, maneuver range. This would result in cease-fires for all firing on the range whenever a private or commercial aircraft approaches. The Controlled Firing Area is slightly larger than the surface danger zone to provide an extra margin of safety and administrative control.

PCMS currently has no restricted airspace or other designations restricting any aircraft from flying over the maneuver site. An air guard will be posted during all firing events on the range and would shut down training whenever nonmilitary aircraft approach. Firing would then resume after the aircraft left the area4. Military aircraft will be used to support this live fire training.

Range Operations

During range convoy operations, vehicles would travel in a north-northwest direction along this route. Convoys would encounter different target arrays along both sides of the route, ranging from 50 to 1,000 meters on either side. Targets would be fired on from inside the vehicles as well as from soldiers on foot around the vehicles. Range firing could start at the "Start Fire" point, and all range firing would cease at the "End Fire" point, except that .50 caliber machine gun firing would cease at the "50 Cal End Fire" point (to keep rounds within the safety danger zone). Training would include firing at targets from roads and advancing/firing on targets from roadways (maneuver), both types of firing using the same surface danger zone.

For ground forces, weapon systems used would be small arms, .50 caliber and below, and M203/MK19 40mm grenade launcher, using only practice grenades (non-explosive) and pyrotechnics already authorized for use at PCMS to include smoke within the parameters of Fort Carson regulations governing the use of smoke and obscurants. Green ammunition (projectile has no lead) would be used as the ammunition of choice, whenever it is available. Military aircraft will fire appropriate support munitions in a non-dud producing maneuver. The availability of green ammunition is limited; thus, this environmental assessment assumes that lead will be used on the range.

[4] El Paso Pipeline Company inspects its pipeline (just to the east of the surface danger zone) by flying northeast to southwest above the pipeline. These inspection flights would not be hindered by operation of the range and would require coordination between El Paso Pipeline Company and PCMS range operation controllers.

Maneuver scenarios could use 81 mm, non-dud producing (non-explosive practice rounds) mortar rounds. The 81 mm mortar practice rounds are either filled with concrete or are hollow. Military aircraft firing 20/30mm chain guns and .50 caliber weapons could be incorporated into training scenarios. Military aircraft weapons firing would use the same firing limitations as surface weapons (*i.e.*, start and end points and firing orientation).

A training exercise would consist of a maximum of 660 wheeled and 350 tracked vehicles[5]. Aviation support would use OH-58D, AH-64, and UH-60 rotary wing aircraft. 81 mm mortars would be used infrequently, to deliver practice, smoke, and illumination rounds. No M1A1 tank main guns (120 mm) or M2A3 tank chain guns (25 mm) would fire reduced range ammunition on the range so as not to exceed the depth of the surface danger zone. Tanks and Bradleys would fire 7.62 mm coaxial and .50 caliber, turret-mounted weapons systems using the same firing limitations as other weapons (*i.e.*, start and end points and firing orientation). All convoy operations training would be in accordance with the 7th Infantry Division Convoy *Live Fire Exercise Handbook/Standard Operating Procedures*, April 2004.

Burson Camp (a 1969-built ranch) that is now used by Fort Carson staff and U.S. Geological Survey personnel when doing primarily invasive weed control and watershed monitoring at PCMS (1-12 personnel for about 150 days annually) is located within the surface danger zone. This camp could not be operational during training exercises and may be damaged by bullets fired during training; however, this is unlikely due to terrain features.

Portions of MSR 1 and MSR 3 (to include the intersection of the two roads) would be closed during operation of the live fire, maneuver range as they pass within the surface danger zone. Traffic on roads that could be impacted during training on the range would be controlled by the use of temporary barricades placed along roads outside the surface danger zone and the presence of guards.

Overhead electric lines (San Isabel Electric Association) running from the north, bisecting the surface danger zone along MSR 3, are used to supply electricity to Burson Camp and further south to a windmill. These lines would be repaired by San Isabel Electric Association when damaged by training activities. An agreement for these reimbursable repairs would be negotiated by Fort Carson and the Association. The power line running along MSR 3 just to the northeast near the urban targetry would be particularly vulnerable to damage. Transformers associated with power lines have no PCBs, according to San Isabel Electric Association. A buried fiber optic line runs along the northern side of MSR 1 within the surface danger zone and along the western side of MSR 3 from MSR 1 to the Federal Aviation Administration tower.

The ***gas pipeline*** that bisects PCMS is not within the surface danger zone of the proposed range. A permitted Federal Aviation Administration ***Air Route Surveillance Radar site, its access road right-of-way, and Radar Microwave Link site*** (identified as "FAA Tower" on maps) are just outside of the surface danger zone to the northwest. The Microwave Link site is approximately 300 meters south of the Surveillance Radar site. This tower also has other antenna, including one for PCMS. A ***Federal Aviation Administration Calibration Performance Monitoring Equipment*** site just north of the intersection of MSR 1 and 3, is well within the surface danger zone.

A safety berm would be constructed in front of this equipment site. A range safety barrier (swing-arm gate painted red and white with a flashing light) would be installed on MSR 3 just south of the FAA Tower. This gate would be locked during range operation. The Federal Aviation Administration would have access to their equipment 24 hours per day, 7 days per week. If the range is operational (*i.e.*, gate

[5] Much smaller groups of vehicles would use the range at any one time during large exercises.

is closed), Fort Carson would check-fire the range and open the gate to allow Federal Aviation Administration personnel to access the Calibration Performance Monitoring Equipment inside this gate.

Four Corners Campground is just southwest of the intersection of MSR 1 and 3. This campground is used primarily by recreationists; it would be closed during range operations.

The project would be constructed using inhouse capabilities. Construction is scheduled to begin and be completed in 2005.

3. ALTERNATIVES CONSIDERED

This section describes alternatives to the Proposed Action. Army (AR 200-2) and Council on Environmental Quality regulations (40 CFR 1500) require the identification of reasonable alternatives to the Proposed Action, including the No Action Alternative.

3.1 Alternative 1 – No Action

There would be no construction or operation of a live fire, maneuver range under the No Action Alternative. The No Action Alternative provides a basis of comparison for the Proposed Action and also addresses issues of concern by avoiding or minimizing effects associated with the Proposed Action. This alternative will be considered in the environmental consequences analysis to provide a baseline for comparing effects of the Proposed Action on current environmental conditions.

3.2 Alternative 2 – Alternative PCMS Sites

Alternative 2 would be to construct and operate a live fire, maneuver range on other sites on PCMS. The following siting requirements are important to meet mission requirements for proposed live fire, maneuver range alternatives:

- ensuring the surface danger zone is completely within boundaries of PCMS;
- ensuring the site is suitable for designing a range that provides opportunities for safe, adequate training to soldiers for the mission identified (*e.g.*, target visibility, relatively straight-line vehicular access within firing box, all-weather access to site);
- minimizing effects on the other military missions at PCMS, particularly maneuver training;
- minimizing significant environmental effects (*e.g.*, avoidance of National Register of Historic Places-eligible cultural resources sites and Native American sacred sites; avoidance of effects to federal-listed species, special interest areas, and wetlands); and
- minimizing safety, health, and nuisance issues, particularly with the general public (*i.e.*, avoiding areas near existing or likely future development, minimizing off-installation noise).

For initial site selection, the surface danger zone was overlain onto all areas of PCMS where it would fit without impacting certain structures.

- The ***gas pipeline*** that bisects PCMS severely restricts areas where live fire can be used in training, and the pipeline cannot fall inside the surface danger zone of any live fire range (Figures 2.1a and b).
- A permitted Federal Aviation Administration ***Air Route Surveillance Radar site, its access road right-of-way, and Radar Microwave Link site*** that existed when PCMS was acquired by the Army must be outside of the surface danger zone or protected from damage. The Microwave Link site (labeled "FAA Tower" on Figures 2.1a and b) is approximately 300 meters south of the Surveillance Radar site. A ***Federal Aviation Administration Calibration Performance Monitoring Equipment*** site is just north of the intersection of MSR 1 and 3. The Federal Aviation Administration was granted use of the properties under Permit Number DACA45-4-83-6064 beginning in 1982. The permit is amended to extend the term of the permit every five years, the most recent extension having been executed in November 2002.
- The ***cantonment area*** and its immediate environs must not be included within the surface danger zone.

Figure 2.0 shows alternative sites considered on PCMS for the live fire, maneuver range.

Alternative A – This alternative was immediately discarded because of the richness of cultural resources in the area of the "hogback," a geological feature running along the southern border of PCMS. Native American rock art and sacred sites are found in high concentrations in this area. A Memorandum of Agreement between Fort Carson and the Jicarilla Apache is currently in draft for treatment of the Hogback as a Traditional Cultural Property. There are 61 known archaeological sites located within this alternative that are eligible for inclusion in the National Register of Historic Places, with 40% (9,700 acres) of the area remaining to be surveyed.

Alternatives B and C – These alternatives overlay basically the same area on PCMS, with firing points on B facing west and firing points on C facing east. Alternative B was considered tactically viable, with existing roads and trails for the convoy to travel along and existing buildings from an old ranch that could be used for urban training scenarios. These alternatives were discarded from further analysis because of several eligible cultural sites, to include a National Register District-eligible historic ranching complex (John Sanders Cross Ranch) located within the surface danger zone that includes a Native American sacred site. Alternative B contains 52 known archaeological sites that are eligible for inclusion in the National Register of Historic Places, with 50% (12,160 acres) of the area remaining to be surveyed. Alternative C contains 50 National Register-eligible sites with 49% (11,903 acres) of the area remaining to be surveyed.

Alternative D – This alternative was discarded because of the canyons located within the surface danger zone. Many cultural sites are found within these canyons, and unsurveyed areas are expected to yield a large number of eligible sites. This alternative contains 137 archaeological sites eligible for inclusion in the National Register of Historic Places, with 23% (5,647 acres) of the area currently unsurveyed.

Alternative E – This alternative was considered tactically unfeasible because of line-of-sight problems with the targets. This alternative would have caused major environmental damage due to large amounts of earth that would have to be excavated (several hills removed) to resolve line-of-sight issues.

Alternative F – This alternative is a modified version of the proposed range, located over the existing static small arms ranges surface danger zones, just south of the cantonment area. Range firing positions would be located so that the surface danger zone would be smaller than the one for the Proposed Action. This alternative would fit over the existing static small arms ranges, and extend outward from there. This alternative has a significant advantage in that it uses existing surface danger zones from the static small arms ranges. However, this alternative reduces the freedom of maneuver to train convoys moving over a designated distance without enlarging the surface danger zone into unacceptable areas (*i.e.*, cantonment, pipeline, Hogback). Existing small arms ranges are for static fire, and the two ranges would compete, *i.e.*, no static weapons firing while a maneuver live fire exercise was being conducted, somewhat limiting a commander's ability to train his/her unit across a broad spectrum of activities simultaneously. There are six eligible archaeological sites in this alternative, with 5.6% (655 acres) currently unsurveyed. There is also a Native American burial site located within the surface danger zone. However, due to topography and its proximity to the external boundary line, the burial is not considered to be in danger of impact from training in this alternative. The approximate size of the surface danger zone (this would also include the range footprint) of Alternative F would be 9,900 acres.

After initial investigation of these six alternative sites to the proposed action on PCMS, all but the Proposed Action and Alternative F were discarded on the basis of being either tactically unacceptable to support the mission, or being environmentally unsound, primarily due to cultural resources considerations.

Alternative F (Static Ranges Overlay) is the only alternative PCMS site that potentially would achieve the purpose and need for the range. The Proposed Action meets these requirements, and other environmental issues (vegetation effects, potential erosion) can be resolved with mitigation. There are no compelling reasons to seriously consider other sites that do not meet all the above requirements.

Thus, only Alternative F (Static Ranges Overlay) will be considered in the environmental consequences due to the other alternatives failing to meet mission requirements. The *Environmental Assessment for the Construction/Operation of Firing Ranges and Other Training Facilities, Pinon Canyon Maneuver Site, Colorado* (Gene Stout and Associates 2004) analyzed the introduction of small arms live fire operations at PCMS. Much of this analysis is also applicable to Alternative F for the Proposed Action.

3.3 Alternative 3 – Alternative Fort Carson Sites

Fort Carson has training ranges (*i.e.*, Multipurpose Range Complex, Range 155, and Range 111) where live fire, maneuver can be conducted, including convoy operations training. As stated in Section 1.3, *Purpose and Need for the Proposed Action, A Live Fire, Maneuver Range*, Fort Carson ranges are operating near full capacity, particularly during mobilization. Additional live fire, maneuver ranges cannot be constructed on Fort Carson without significant adverse effects on other required training missions. This alternative will not be considered in the environmental consequences due to Fort Carson not meeting mission requirements for units designated for training at Pinon Canyon.

4. AFFECTED ENVIRONMENT, ENVIRONMENTAL CONSEQUENCES, AND MITIGATION

This section discloses potential environmental effects of each alternative and provides a basis for evaluating these effects in context relative to effects of other actions. Effects can be direct, indirect, or cumulative. Direct effects occur at the same place and time as the actions that cause them, while indirect effects may be geographically removed or delayed in time. A cumulative effect is defined as an effect on the environment that results from the incremental effect of the action when added to other past, present, and reasonably foreseeable future actions, regardless of what agency or person undertakes such other actions. Cumulative effects can result from individually minor, but collectively significant, actions taking place locally or regionally over a period of time.

This environmental assessment focuses on resources and issues of concern identified during initial issue analysis and on differences in effects between the Proposed Action and the No Action Alternative. Areas with no discernible concerns or known effects, as identified in the issue elimination process (Section 4.1, *Issues Not Addressed*), are not included in this analysis. Issues identified during the public review process were added, as needed.

For ease in comparing environmental effects with existing conditions and mitigation specific to each environmental area of concern, each below section will describe existing conditions, describe the effects of each alternative, identify any cumulative effects on that area of concern, and describe site-specific mitigation. General mitigation that affects many of these environmental areas of concern is identified in Section 4.11, *General Mitigation*. A summary of environmental consequences is provided in Chapter 5.

4.1 Issues Not Addressed

Initial issue analysis resulted in the elimination of some potential issues because they were not of concern or were not relevant to the Proposed Action and alternatives. Brief discussions of the rationale for these decisions are below.

Environmental Health and Safety Risks for Children

Executive Order No. 13045, *Protection of Children from Environmental Health Risks and Safety Risks*, (62 Federal Regulation No. 78) was issued in April 1997. This Executive Order directs each federal agency to "*ensure that its policies, programs, activities, and standards address disproportionate risks to children that result from environmental health or safety risks*". Sensitive areas for exposure to children are schools and family housing areas. Environmental health and safety risks are attributable to products that a child might come in contact with or ingest as well as safety around construction areas and areas of buildings that pose safety hazards.

Neither the Proposed Action nor its alternatives would change environmental health or safety risks to children since the proposed range would be within the boundaries of PCMS in a very rural area. There is no family housing on PCMS. There are no schools (closest is 18 miles south) or other centers of child activity in the area. Construction and operation of the range would comply with Department of Defense/Army safety standards. Neither the proposed action nor its alternatives would have significant or disproportionate adverse effects on children or pose health or safety risks.

Environmental Justice

Executive Order No. 12898, *Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations* (59 Federal Regulation No. 32), issued in February 1994, provides that "*each Federal agency shall make achieving environmental justice part of its mission by identifying and*

addressing, as appropriate, disproportionately high and adverse human health or environmental effects of its programs, policies, and activities on minority populations and low-income populations".

Neither the Proposed Action nor its alternatives would change any existing impacts with regard to minority and low-income populations.

Geology and Topography
Neither the Proposed Action nor its alternatives would have any measurable effects on geologic resources or topography.

Air Quality
Neither the Proposed Action nor its alternatives would affect air quality. The Directorate of Environmental Compliance and Management would obtain Colorado air permits for construction of the projects, if required. The operation of heavy equipment during construction of the project would release a non-significant amount of carbon monoxide into the air. Appropriate emission control devices on vehicles would minimize effects to air quality during construction. Smoke generated during range operations would be the same as already used for maneuver in that area of PCMS. Dust generated during range construction would be short-term and not significant. Dust generated during range operations would be less than amounts generated by many PCMS maneuver operations, particularly since operations would be road-oriented.

Noise Environment
Actual live fire noise data and contours have not been gathered or plotted for PCMS. However, neither the Proposed Action nor its alternatives would change off-installation environmental noise conditions, based on standard noise generation models used by the Department of the Army. The most important source of noise at the PCMS originates from short-term military training exercises and military aircraft operations. PCMS baseline noise levels are about 48 decibels, increasing about 10 decibels during training events. As shown in the analysis for small arms ranges just south of the PCMS cantonment area (Gene Stout and Associates 2004) (similar to Alternative F, Static Ranges Overlay), the noise from a .50 caliber machine gun would be 56-78 decibels at 2,000 meters from the firing point; 63 decibels of noise generate complaints from only about two percent of people. The nearest boundary to the Proposed Action is about 4,000 meters from the closest firing point; at such ranges small arms noise is negligible. Comments from ranchers at public meetings in La Junta and Trinidad (February 1 and 2) indicated that noise from the static ranges (about 1,000 meters from the boundary) was not significant.

Hazardous Waste/Materials
Neither the Proposed Action nor its alternatives would generate additional hazardous wastes or use additional hazardous materials. The likelihood to encounter contamination on proposed project sites is remote. Any discovery of hazardous material contamination would require appropriate regulatory coordination and compliance.

Any spills would be cleaned up in accordance with the Fort Carson Spill Prevention, Control, and Countermeasures Plan and Fort Carson Regulation 200-1 (Chapter 9). The only fuel stored on the range would be small quantities needed to operate the four generators used to operate the four range safety markers. An Environmental Protection Plan would be prepared for the project.

Facility operation is not anticipated to generate hazardous substances beyond those already occurring on the area due to military operations, with exception of the storage and use of munitions. Initially, ammunition for the firing ranges would be transported to PCMS in trucks and issued via Field Ammunition Supply Points, with appropriate security and accountability procedures for live

ammunition. Eventually, an Ammunition Storage Point (buildings, security fencing, and guards) would be required, but that is beyond the scope of this Proposed Action and would require separate NEPA analysis.

Lead ammunition would be used on the range. Lead is not a pollutant controlled as a hazardous waste. Potential effects from the use of lead ammunition are discussed in sections 4.5, *Soils* and 4.6, *Water Resources*.

4.2 General Information – Location, Surrounding Land Uses, and Climate

PCMS, occupying 235,896 acres, is located approximately 150 miles southeast of Fort Carson and is totally located in Las Animas County, Colorado (Figure 4.2a). PCMS measures about 31 miles east to west and about 21 miles north to south. The 1,670-acre cantonment area is located at the west central edge of PCMS, adjacent to Colorado Highway 350. PCMS is bordered on the north by the Comanche National Grassland and private interests; on the east by the Purgatoire River and U.S. Forest Service (Picket Wire Canyonlands); on the south by County Road 56.0; and on the west by State Highway 350 and private property (Figure 4.2b). Land use adjacent to the PCMS is primarily used for livestock grazing, agriculture, and recreation.

Figure 4.2a. Location of Piñon Canyon Maneuver Site

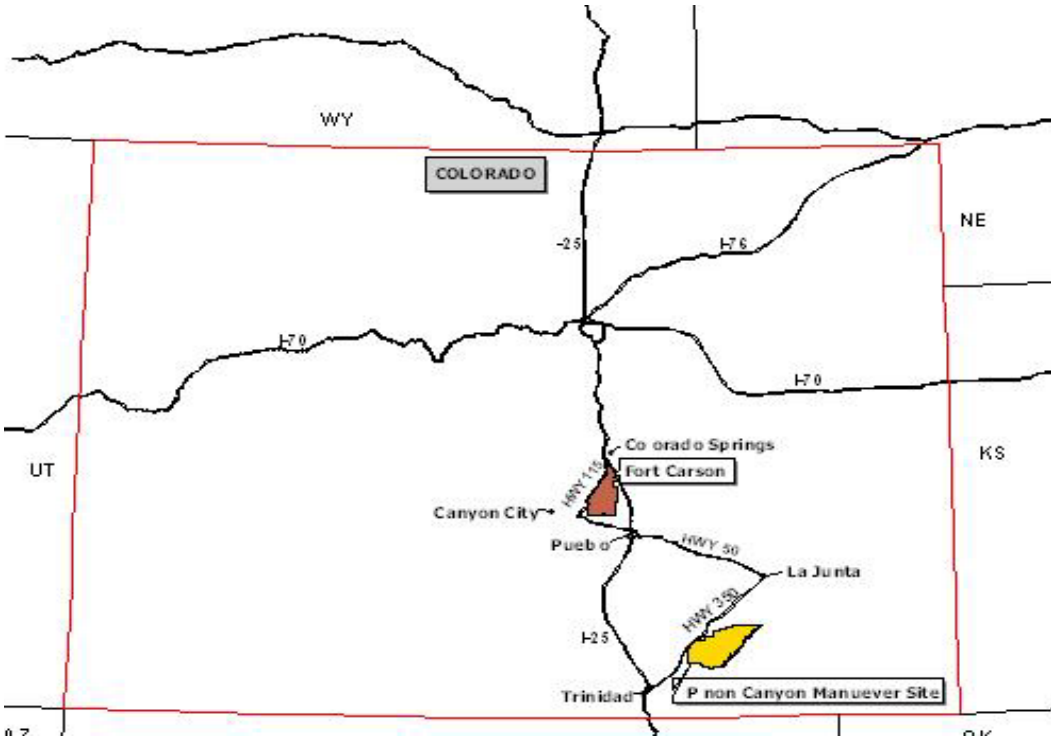
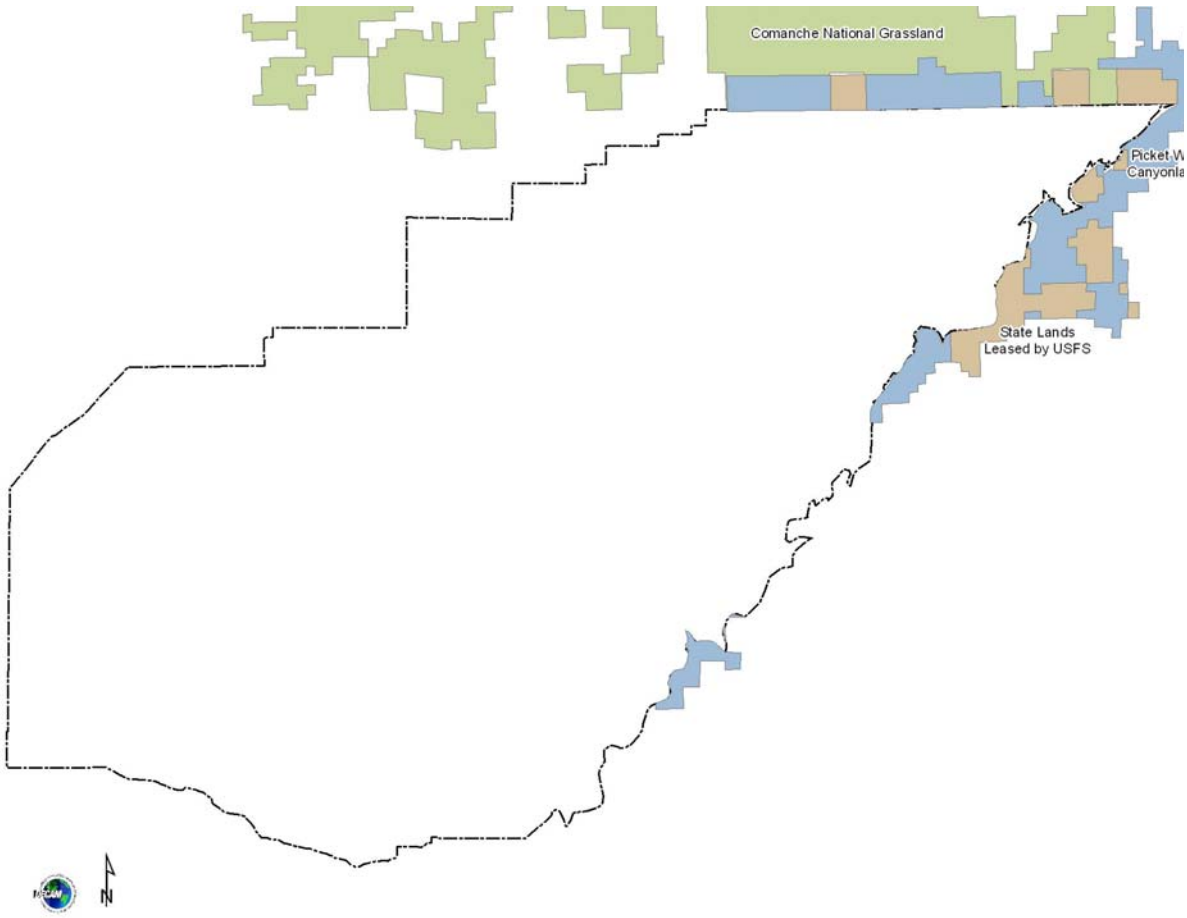


Figure 4.2b. Lands Neighboring Piñon Canyon Maneuver Site



Green – U.S. Forest Service Comanche National Grasslands
Blue – U.S. Forest Service Picket Wire Canyonlands
Brown – State lands leased by U.S. Forest Service
No color – Private lands

The climate in the PCMS area is classified as dry continental with average annual precipitation of approximately 13.5 inches, fluctuating widely from year to year and between areas of the parcel (U.S. Department of Army 1980, below Table 2.1). Precipitation at the PCMS primarily results from either frontal storms or convective storms. Frontal storms can occur throughout the year and have varying strength and frequency; the largest quantities of precipitation are associated with periods of moist airflow from the Gulf of Mexico. Convective storms occur frequently during July through September (Von Guerard *et al.* 1993). Monthly weather parameters collected by the U.S. Weather Service (www.weather.com) for Trinidad are shown in Table 2.1.

Table 2.1 Summary of Trinidad, CO Climate Data

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Avg. High	46°F	49°F	56°F	65°F	73°F	84°F	88°F	86°F	78°F	69°F	56°F	47°F
Avg. Low	16°F	19°F	25°F	34°F	43°F	53°F	59°F	57°F	49°F	37°F	26°F	17°F
Mean	31°F	35°F	41°F	50°F	59°F	69°F	74°F	72°F	64°F	54°F	41°F	33°F
Avg. Precip.	0.4 in	0.5 in	0.9 in	0.9 in	1.7 in	1.6 in	2.2 in	2.0 in	1.2 in	0.8 in	0.7 in	0.6 in
Record High	80°F 1997	82°F 1979	85°F 1971	91°F 1989	97°F 1996	103°F 1994	103°F 1973	100°F 1980	100°F 1995	89°F 1991	81°F 1980	81°F 1980
Record Low	-32°F 1963	-24°F 1982	-10°F 1965	3°F 1997	22°F 1991	35°F 1976	43°F 1952	43°F 1972	23°F 1984	1°F 1993	-17°F 1976	-19°F 1990

4.3 Mission and Military Population

4.3.1 Existing Conditions

PCMS serves as a major military training facility for military units assigned to Fort Carson, primarily the 7th Infantry Division, comprised of the 39th Enhanced Separate Brigade (eSB), 41st eSB, and the 45th eSB; 3rd Armored Cavalry Regiment; 10th Special Forces Group, Airborne; 43rd Area Support Group; and the 3rd Brigade Combat Team, 4th Infantry Division. The primary mission of Fort Carson is the training and readiness of all assigned and attached troops to ensure combat-ready forces. During 2003 there were 15,854 active duty military personnel at Fort Carson. There were 2,723 Department of Army and Nonappropriated Fund civilian employees. The average 2003 on-post resident population was 11,418, including military dependents. The post serves over 108,223 persons on a monthly basis.

A few civilian employees are permanently assigned to PCMS. The surrounding area is sparsely populated; the population of Las Animas County was (http://www.dlg.oem2.state.co.us/demog/estimate.htm) 16,119 in 1999.

4.3.2 Environmental Consequences

Proposed Action

The construction and operation of a live fire, maneuver range at PCMS would enable units to acquire and maintain proficiency in skills required to survive and win in convoy movement environments. PCMS would have facilities to simulate combat conditions for the training of Active Army, Reserve, and National Guard units in the tactics and techniques required for warfare. The amount of land unavailable for maneuver training during range operations would be about 21,000 acres (9% of total PCMS land). This would affect, but not eliminate, large-scale maneuver operations being conducted simultaneously with the operation of the live fire, maneuver range.

No Action Alternative

A failure to construct and operate a live fire, maneuver range would, in effect, make it impossible for units to acquire and maintain proficiency in skills required to survive and win in convoy movement environments at PCMS. The 7th Infantry Division and Fort Carson would not have facilities on PCMS to simulate combat conditions for the training of Active Army, Reserve, and National Guard units in the tactics and techniques required for warfare.

Alternative F – Static Ranges Overlay

The construction and operation of a live fire, maneuver range at the Alternative F site would enable units to acquire and maintain proficiency in skills required to survive and win in convoy movement

environments. There would be somewhat fewer options for weapons firing directions (narrower individual firing fans) due to a smaller surface danger zone, and there could be some periods when the operation of the live fire, maneuver range and the static, small arms ranges would conflict, requiring scheduling adjustments. However, there would be less potential temporal loss of maneuver land during range operation due to the co-use of the same lands for two types of ranges. PCMS would have facilities to simulate combat conditions for the training of Active Army, Reserve, and National Guard units in the tactics and techniques required for warfare. The amount of land unavailable for maneuver training during range operations would be about 10,000 acres (4% of total PCMS land). This would have a lesser effect than the Proposed Action on large-scale maneuver operations being conducted simultaneously with the live fire, maneuver range but would have a very negative effect on live fire static ranges.

4.4 Land and Airspace Use

4.4.1 Existing Conditions

Military Use
PCMS has had Initial Operation Capability since 1985 to provide critical maneuver lands for larger units on Fort Carson and from other installations in the area. Available mechanized maneuver area is 158,620 acres. The cantonment area contains administrative buildings and support facilities that are used during training exercises. PCMS is utilized for a variety of training missions to include brigade or regiment-size maneuvers, battalion or squadron-size maneuvers, and support operations, such as supply, communications, aviation, etc. In 2004 small arms qualification ranges began operation, which are the only live fire activities at present.

There are no restricted designations for military or civilian use of airspace over PCMS.

Recreation Use
PCMS has a very limited resident community, and access to the installation is restricted, which affect outdoor recreation opportunities. Hunting is the primary activity, and hunters are allowed to camp in designated areas at designated times. Figure 3.4.5b in the Integrated Natural Resources Management Plan (Gene Stout and Associates 2002a) indicates areas open to hunting on PCMS, which include the proposed firing range sites. There is no recreational fishing potential on PCMS.

A permission letter, issued by the DECAM Wildlife Office, is required to enter adjacent public lands from PCMS. Permission must be requested from the DECAM Wildlife Office in writing 30 days in advance.

4.4.2 Environmental Consequences

Proposed Action.
The Proposed Action would not remove maneuver lands, except that the proposed live fire, maneuver range's surface danger zone (20,900 acres or 9% of total PCMS land) would be off-limits to maneuver during range operations.

Airspace over the proposed firing ranges would be closed during those periods when the ranges are active. The 7th ID and Fort Carson has obtained a Controlled Firing Area designation through the Federal Aviation Administration to accomplish this action.

There would be no changes to recreational land use policies. However, when the proposed range is being used, it (20,900 acres) would be off-limits to recreational use. The hunting campground at 4 corners would not be available for use during range use periods, and access to hunting areas east of the surface danger zone would be limited during range use period.

No Action
The No Action alternative would have no effects on military or recreational land or airspace use at PCMS.

Alternative F – Static Ranges Overlay
The Proposed Action would not remove maneuver lands, except that the proposed live fire, maneuver range's surface danger zone (about 10,000 acres or 4% of total PCMS land) would be off-limits to maneuver during range operations. There would be no other changes to military land use.

Airspace over the proposed firing ranges would be closed during those periods when the ranges are active. The 7th ID and Fort Carson has obtained a Controlled Firing Area designation through the Federal Aviation Administration to accomplish this action.

There would be no changes to recreational land use policies. However, when the proposed range is being used, it (about 10,000 acres) would be off-limits to recreational use.

4.4.3 Cumulative Effects

Proposed Action
The 7th ID and Fort Carson military mission can be expected to continue to evolve, in some cases relatively dramatically, as the U.S. armed forces evolve in terms of military units, military equipment, and tactics/strategies change to meet changing threats to U.S. security. Such changes are expected to continue in the future, as they have done so in the past. The nature of these changes with respect to changes at PCMS is difficult to predict due to rapidly changing technology, military tactics and strategy, and world events affecting military activities.

The Proposed Action is another action in this process of an evolving military mission and required new training facilities. Field training for troops using PCMS now requires facilities to support live fire, maneuver training, particularly considering troop losses in Iraq due to convoy ambushes. The Proposed Action is planned to have virtually no permanent features, since building facades and targetry can be removed to allow maneuver. This is part of continuing efforts to balance range development with the need for undeveloped lands with natural environments for realistic maneuver training.

Proposed projects are examples of changes in training requirements that would result in new training facilities at PCMS. The need for the proposed live fire, maneuver range is increased due to the addition of new military missions, particularly the use of Reserve Component forces, which will be mobilized at PCMS.

The loss of land for maneuver training, even when limited to periods of range use, is a cumulative land use effect. The effects would be small, and the trade-off for improved training and mobilization readiness would be well-worth the loss of small areas and certain time-frames for maneuver training. These maneuver land losses would be reversible.

No Action

There would be no cumulative impact from the combined environmental effects on land or airspace use of the No Action Alternative and those of past, present, and reasonably foreseeable future actions.

Alternative F – Static Ranges Overlay
The cumulative effects discussion for the Proposed Action is pertinent to Alternative F. However, due to the smaller surface danger zone and its being overlaid on an existing surface danger zone for the static ranges, land use effects would be somewhat less than those for the Proposed Action.

4.4.4 Site-specific Mitigation

Proposed Action
The Proposed Action site and its nonpermanent features are a maneuver area encroachment, but they have been selected to maintain considerable large maneuver options, even when the range is operational. Areas within range firing fans, beyond targetry protection berms, would be open to maneuver when ranges are not operative. Non-dudding ammunition would be used to enable maneuver to occur[6]. Airspace use restrictions would be confined to those periods of firing range use.

No Action
Land or airspace use mitigation would not be required.

Alternative F – Static Ranges Overlay
Site-specific mitigation for Alternative F would be the same as for the Proposed Action.

4.5 Soils
Additional information regarding soils on PCMS is within the Integrated Natural Resources Management Plan (INRMP) (Gene Stout and Associates 2002a).

4.5.1 Existing Conditions
There are 31 soil series and associations recognized on the PCMS. The distribution of soil types is shown on INRMP Figure 3.2.4b (Gene Stout and Associates 2002a). Soils most commonly affected by erosion are clays, silty clays, and clay loams. Specific information concerning soils can be obtained from the Soil Survey of each individual county area, conducted by the Natural Resources Conservation Service.

PCMS contains four major landscape types. Each landscape type has a characteristic pattern of soils as described briefly below (Nakata Planning Group, LLC 2000).

The first landscape type, located in the western part of PCMS, is dominated by a flat to gently sloping plain. Soils in this portion are formed in wind-deposited lifts with occasional ridges of limestone outcropping in some areas. Soils are generally silty and weakly developed and are calcareous throughout. One small area of sand dunes crosses midway through this landscape type. Soils dominating this landscape are Loamy Plains on upland flats, Saline Overflow in depressions and along intermittent drainages, and Sandy Plains in sand dunes. This landscape type generally has a medium stability rating and will experience moderate soil losses by water erosion and high soil losses by wind erosion if disturbed. These areas would not be affected by the Proposed Action.

[6] There would be the potential for required cleanup of lead ammunition residues in the future, based on such requirements and actions on military installations in northeastern United States.

The second major landscape type is composed of limestone ridges, which cross the northwestern corner of PCMS and form a small divide oriented to the south in the western portion of the training area. Most downrange effects of the Proposed Action would occur within this type.

The third major landscape type occurs between the limestone ridges and the Purgatoire River. It is composed of a wide valley that crosses the PCMS from southwest to northeast. These areas would not be affected by the Proposed Action. The southern and extreme eastern portions of the live fire, maneuver range would be in this area.

The fourth landscape type is where the Purgatoire River canyon and associated side canyons form a series of steep rock-strewn cliffs and rolling mesa tops. These areas would not be affected by the Proposed Action.

The Natural Resources Conservation Service has identified 15 range sites on PCMS. These sites are: Alkaline Plains, Basalt Breaks, Gypsum Breaks, Limestone Breaks, Loamy Plains, River Bottom, Sandstone Breaks, Salt Flats, Saline Overflows, Sandy Plains, Shaly Plains, Sandy Bottomlands, 80% Loamy Plains/20% Gravel, Shaly Plains/Loamy Plains, 75% Shaly Plains/25% Limestone Breaks, and Unknown. Loamy Plains is the most common (40%) range site type on PCMS.

Figures 4.5.1a and 4.5.1b show soils (grouped by range sites) potentially affected by the Proposed Action and Alternative F, respectively. Table 4.5.1 shows acreages of each soil association that are within footprints of the Proposed Action and Alternative F.

4.5.2 Environmental Consequences

Threshold of Significance
The threshold of significance for impacts to soils would be if the Proposed Action could cause erosion resulting in sedimentation that leads to a violation of state water quality laws.

Table 4.5.1. Range Sites (Soil Associations) Within Footprints of the Proposed Action and Alternative F

Range Sites	Acreages of Proposed Projects			
	Proposed Site (Acres)	Proposed Site (% of PCMS Total)	Alternative F (Acres)	Alternative F (% of PCMS Total)
Loamy Plains	5,846	6%	3,494	4%
Limestone Breaks	7,063	31%	2,469	11%
Sandy Plains	1,549	27%	1,318	23%
Shaly Plains	3,060	11%	2,037	7%
Alkaline Plains	2,545	23%	170	2%
Saline Overflow	765	15%	401	8%
Salt Flats	71	4%	0	NA
Totals	20,899	9%	9,889	4%

Figure 4.5.1a. Range Sites (Soils) Potentially Affected by the Proposed Action

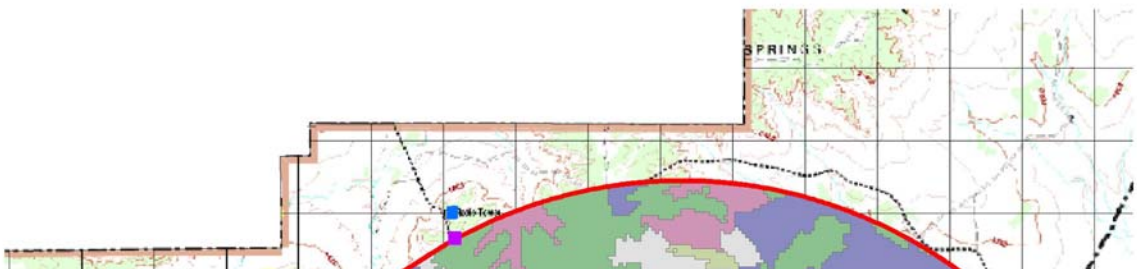
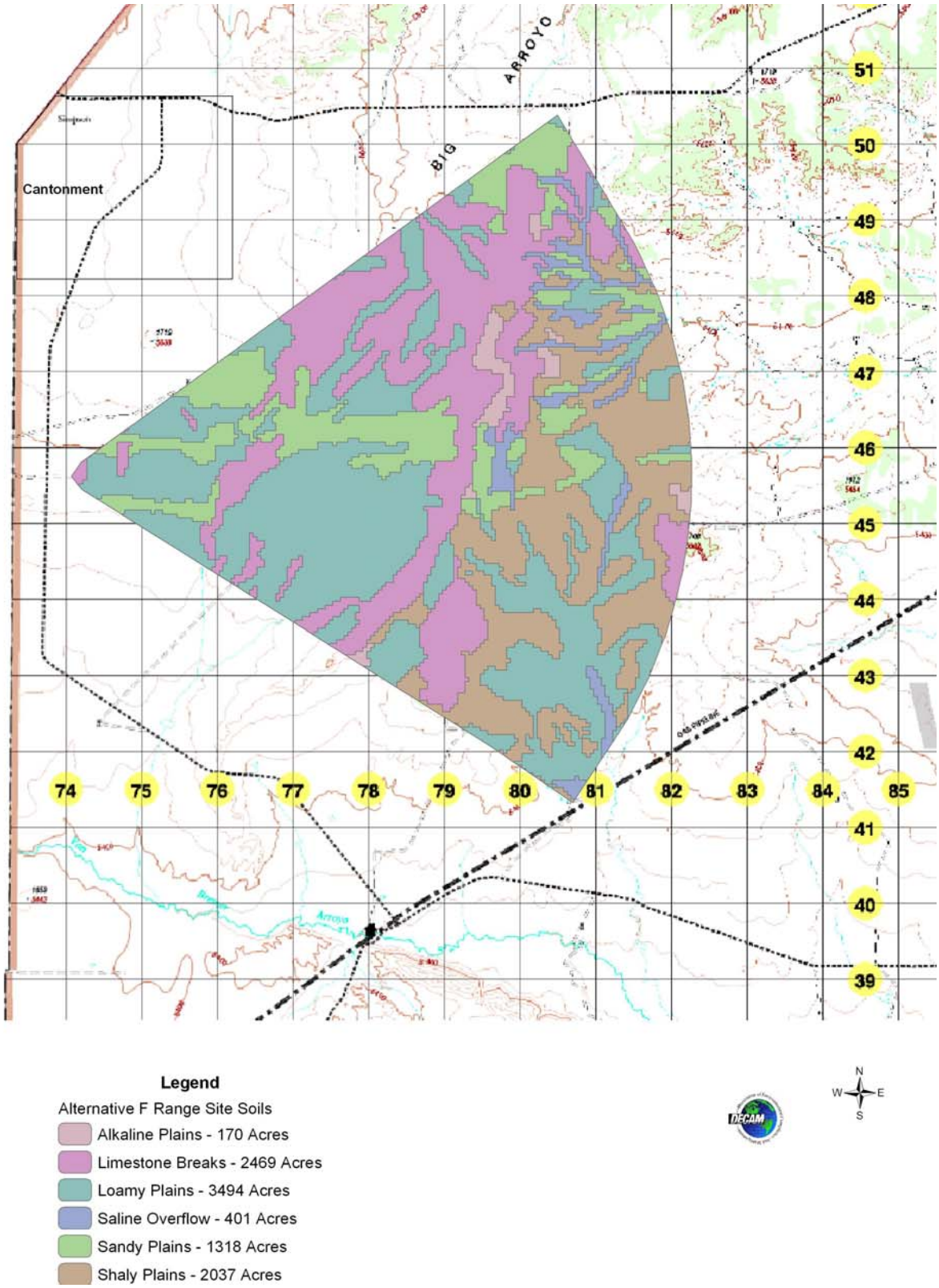


Figure 4.5.1b. Range Sites (Soils) Potentially Affected at the Alternative F Site



Proposed Action
The Proposed Action would potentially affect soils via construction (*e.g*., range tower, berms, parking area, roads) and maneuver activities. Areas disturbed by construction could experience soil losses by water and wind erosion, unless such disturbance is mitigated. Less than 10 acres of soils would be permanently denuded (building, road, and targetry footprints) by construction at the proposed live fire, maneuver range. Most of this acreage is now relatively undisturbed Loamy Plains, Alkaline Breaks, and Sandy Plains. Most damaged land would not be re-vegetated, as these features would be mostly permanent for the life of the range. Surrounding areas collaterally damaged would be revegetated by DECAM/Directorate of Plans and Training as part of the project with native seed mixtures.

Proposed construction would not have any adverse effects on soils beyond construction sites. There would be no requirement for borrow sites beyond small amounts (*e.g*., small targetry berms) from the immediate area of construction. Operation of the live-fire range would affect soils through the impact of small arms munitions within range firing fans and also by disturbance of vegetation and soils during off-road maneuver. These rounds would not be explosive, so effects would be very small.

There is no known contamination of soils on the proposed site. The use of green ammunition (*i.e*., non-toxic bullets) as the ammunition of choice (when available) would minimize the potential of significant toxic materials (primarily lead) in the soils. Even green ammunition contains some lead in the primer and gunpowder, which settles on the soil. The lead is relatively immobile in soil conditions.

However, green ammunition is not available for all weapons in adequate amounts, and thus, this environmental assessment assumes that until such green ammunition becomes available for all weapons, lead-based ammunition would be used on the range. During those periods when green ammunition is not available, lead-based rounds would be deposited downrange. The amount of lead that would be deposited in any given area would be dependent upon its distance from targetry (*i.e*., the further downrange from targets, the less lead that would be deposited) and the degree to which the area in question is from the lines of fire (*i.e*., areas directly in front of targetry would receive more lead than areas to the side).

The three primary processes controlling the mobility of lead at shooting ranges are 1) surface water runoff, 2) leaching to and transport in groundwater, and 3) generation of fugitive dust. Since lead binds tightly to soil particles, the potential and extent of lead leaching to and being transported in groundwater usually are not significant. Likewise, generation of fugitive dust at ranges is expected to be relatively insignificant due to vegetative cover and dust remediation at the firing line and downrange (Peddicord 1996, Morton 2001, U.S. Environmental Protection Agency 2001).

The greatest concern is surface runoff of lead dissolved in water, bound to soil and sediment particles, and/or small, metallic fragments (Morton 2001). Minimal rainfall at PCMS would minimize the water transport of spent munitions, as well as erosion control where soil is disturbed during construction, and lead would be relatively immobile in PCMS soil conditions.

There is the potential that lead-contaminated soils would need to be remediated at some point in the future. If this were to occur, it is likely that considerable soil disturbance would be required downrange of the proposed live fire, maneuver range.

No Action
Soils would not be affected under this alternative. No new construction would occur, and erosion rates would not exceed those occurring at the present.

Alternative F – Static Ranges Overlay
The discussion of the effects of the Proposed Action on soils is pertinent to Alternative F. However, there would be less potential effects at the Alternative F due to a smaller surface danger zone and the use of some areas that have already been disturbed for construction and operation of the small arms static ranges (*e.g.*, roads, firebreaks, parking area, towers). The use of Alternative F would result in lead ammo deposition in one area (on the static ranges overlay) instead of two parcels (static range and Proposed Action site).

4.5.3 Cumulative Effects

Proposed Action
Army occupation of PCMS has resulted in a relatively permanent changed soil structure where construction has occurred (*e.g.*, cantonment area, combat landing strip, improved roads, range facilities). The Proposed Action continues this process on those areas where the range tower, parking area, roads, etc. would be located. This cumulative effect would not be significant. Operation of the facilities would not have any known cumulative effects on soils. The use of lead-based ammunition (including green ammunition to a much lesser degree) would potentially increase future cleanup costs, if such mitigation becomes a requirement.

No Action
There would be no cumulative effect from the combined environmental effects of the No Action Alternative and those of past, present, and reasonably foreseeable future actions.

Alternative F – Static Ranges Overlay
The discussion of cumulative effects of the Proposed Action on soils is pertinent to Alternative F. However, there would be less potential cumulative effects at the Alternative F due to a smaller surface danger zone and the use of some areas that have already been disturbed for construction and operation of the small arms static ranges (*e.g.*, roads, firebreaks, parking area, towers). The use of lead-based ammunition (including green ammunition to a much lesser degree) at a site that already contains lead would minimize future cleanup costs, if such mitigation becomes a requirement.

4.5.4 Site-specific Mitigation

Proposed Action
Best management practices to control erosion, such as the use of silt fences, would be used to minimize soil loss from sites disturbed by project construction. Mitigation for increased maneuver would consist of re-seeding and erosion control projects. If contamination on construction sites is discovered during preconstruction or construction, appropriate soil remediation would be implemented. There is the potential that lead-contaminated soils would need to be remediated at some point in the future. If that becomes a requirement, Fort Carson would use the best available technology to accomplish this remediation. The U.S. Environmental Protection Agency (2001) has published a manual, *Best Management Practices at Outdoor Shooting Ranges*, which would be useful in developing such remediation practices.

No Action
Soil damage or contamination mitigation would not be required.

Alternative F – Static Ranges Overlay

Site-specific mitigation for soils at Alternative F would be the same as for the Proposed Action, but the costs would be minimized due to the use of the same general area for both the static ranges and the live fire, maneuver range.

4.6 Water Resources

Additional information regarding water resources on PCMS is in the INRMP (Gene Stout and Associates 2002a). Unless stated otherwise, below information is from that source.

4.6.1 Existing Conditions

PCMS includes several major drainages. The Big Arroyo drainage system is located in the northwest region and flows into Timpas Creek, which is approximately three miles northwest of PCMS. The Purgatoire River and 10 ephemeral, intermittent, or perennial tributaries are also located within and adjacent to PCMS (Bramblett 1989). The Purgatoire River, which flows in a northeasterly direction, is a seventh-order tributary to the Arkansas River. Project site drainage is mostly into the Purgatoire River, generally via Taylor and Lockwood arroyos. Smaller areas of the site drain into Timpas Creek via Big Arroyo.

Primary sources of groundwater on the installation are the Dakota Sandstone Formation and the Cheyenne Sandstone Member of the Purgatoire Formation (Von Guerard *et al*. 1987). Groundwater movement in the northeastern parts of the PCMS generally is toward the northeast, and groundwater movement throughout the remainder of the PCMS (where the Proposed Action would occur) is toward the east and southeast. Recharge of the aquifer is primarily from precipitation and subsurface inflow from adjoining areas. Where outcrop areas are traversed by ephemeral streams, occasional flood flows provide some local recharge of very limited areal extent (Von Guerard *et al.* 1987).

There are approximately 95 drilled wells on PCMS; 10 with submersible electric pumps (used for ranch houses and water lines), 10 wind-powered, and 11 solar energy-powered are currently functional. Several major wells have distribution lines associated with them to fill stock tanks, now used for wildlife management and fire suppression.

4.6.2 Environmental Consequences

Threshold of Significance

The threshold of significance for impacts to water resources would be if the Proposed Action could cause unpermitted deposition of dredged or fill material into wetlands or other "Waters of the U.S.", a violation of state water quality criteria, a violation of federal or state discharge permits, and/or potential degradation of an aquifer.

Proposed Action

Soil disturbance (potential waterway sedimentation) would occur during construction and during maneuver, but best management practices to control erosion, such as the use of silt fences, would be used to ensure soils do not erode from the site or increased sedimentation does not enter waterways during construction. Minimal rainfall would minimize the water transport of disturbed soils and spent munitions into waterways.

The proposed location of the live fire, maneuver range is in the recharge path for the Dakota/Purgatoire aquifer, which is a major source of groundwater for residential wells in this region. There are about six wells within 10 miles of the proposed range site that derive their water from this aquifer, including Biernacki, Burson, and Big Canyon ranches on PCMS.

Standard ammunition contains lead in the "bullet" and in the primer and gunpowder; lead settles on the soil. Even green ammunition contains some lead in the primer and gunpowder. As stated in Section 4.5.2, *Environmental Consequences* (Soils), lead binds tightly to soil particles; therefore, the potential and extent of lead leaching to and being transported in groundwater usually is very low.

Alternative 1 – No Action
Neither surface nor ground water would be affected under the No Action Alternative.

Alternative F – Static Ranges Overlay
The discussion of the effects of the Proposed Action on water resources is pertinent to Alternative F. The geology at Alternative F is very favorable. The lower Niobrara Formation (Fort Hays Limestone Member) is at the surface and most likely continues about 100+ feet subsurface until the Dakota-Purgatoire subcrops. The Niobrara is very impermeable to infiltration and any incident precipitation runs off outcrops. Local drinking water sources would be not affected by the Proposed Action due to climate (limited rainfall), local geology (impermeable Niobrara Formation), and preventative practices (erosion control).

4.6.3 Cumulative Effects

Proposed Action
Water resources effects from past and current Army actions, when added to the anticipated environmental effects of the Proposed Action, would not result in any significant effect to area water resources. Therefore, there would be no cumulative effect from the combined environmental effects of the Proposed Action and those of past, present, and reasonably foreseeable future actions.

No Action
There would be no cumulative effect on water resources from the combined environmental effects of the No Action Alternative and those of past, present, and reasonably foreseeable future actions on water resources.

Alternative F – Static Ranges Overlay
The discussion of cumulative effects of the Proposed Action on water resources is pertinent to Alternative F.

4.6.4 Site-specific Mitigation

Proposed Action
There is no evidence to suggest that any spent lead would enter groundwater aquifers. Best management practices to control erosion, such as the use of silt fences, would be used to ensure increased sedimentation does not enter waterways.

Standard spill prevention measures would be taken during construction and operation of the proposed range. If contamination on construction sites is discovered during preconstruction or construction, appropriate soil remediation would be implemented to protect surface and ground waters.

Pollutants; petroleum, oil, and lubricants; and any hazardous materials associated with military operations at Proposed Action facilities may directly affect soil resources. All military units are required to possess and have available appropriate spill response materials for types and quantities of hazardous materials they may transport to support military operations. Any spills would be promptly cleaned up. All spills/releases greater than five gallons would be reported to Range Control, who would

notify the Fire Department for spill response. Spills greater than five gallons and those that enter waterways would be reported to the Directorate of Environmental Compliance and Management, which would then follow through with appropriate reporting requirements and mitigative measures.

No Action
Water resources mitigation would not be required.

Alternative F – Static Ranges Overlay
Site-specific mitigation for Alternative F would be the same as for the Proposed Action with regard to water resources except to note that it is about 12 straight miles from the Alternative F site to the Purgatoire River.

4.7 Flora

Additional information regarding flora on PCMS is in the INRMP (Gene Stout and Associates 2002a). Unless stated otherwise, below information is from that source.

4.7.1 Existing Conditions

INRMP Figure 3.3.1b (Gene Stout and Associates 2002a) show very general vegetation types on PCMS.

General
Grasslands comprise about 52% of PCMS and are usually classified as shortgrass prairie. Major grasses include blue grama (*Bouteloua gracilis*), western wheatgrass (*Agropyron smithii*), galleta (*Hilaria jamesii*), sideoats grama (*Bouteloua curtipendula*), dropseeds (*Sporobolus* sp.), buffalo grass (*Buchloe dactyloides*), little bluestem (*Schizachyrium scoparium*), and needle and thread grass (*Hesperostipa comata*). Various shrubs scattered throughout the grasslands are prickly pear cactus (*Opuntia* sp.), cholla cactus (*Opuntia* sp.), yucca (*Yucca glaucca*), four-winged saltbush (*Atriplex canescens*), rabbitbrush (*Chrysothamnus* sp.), and skunkbush sumac (*Rhus trilobata*).

Shrublands, typically with grass understory, comprise about 22% of PCMS vegetation. Coniferous shrubland, dominated by pinyon pine (*Pinus edulis*) and one-seeded juniper (*Juniperus monosperma*), is found throughout PCMS. Deciduous shrubland, whose species include Gambel oak (*Quercus gambelii*), salt cedar (*Tamarix pentandra*), and willow (*Salix* sp.), is found along major drainageways.

Forest/Woodlands constitute about 26% of PCMS. Pinyon pine and one-seeded juniper are the dominant species of higher elevation woodlands on rocky and steeper slopes, and cottonwood (*Populus deltoides*) and willows dominate woodlands of drainageways.

Vegetation at PCMS occurs as a result of many factors. Droughts of the 1920s and 1930s may have influenced the current vegetation. Parent materials have dictated soil types. The mosaic of vegetation on the PCMS is due, in part, to soils that developed from sandstone, limestone, basalt, and shale parent materials. Variations in topography have affected the occurrence of plant species. Land use practices have also altered the vegetation. Fire as a natural ecological process has been eliminated or controlled by man. Prior to 1983, the PCMS was ranched for over 100 years. Undoubtedly, pressures associated with grazing have affected the area (Shaw *et al.* 1989a).

Figures 4.7.1a and 4.7.1b show vegetation types potentially affected by the Proposed Action and Alternative F, respectively. Table 4.7.1 shows comparisons of potential vegetation effects between the Proposed Action and Alternative F.

Condition Trends
Land Condition Trend Analysis data for PCMS show that vegetation condition improved significantly from the time of acquisition through about 1992 and has been relatively stable or improving since then.

Floral Inventory
Lists of plant species found on PCMS (Appendix 3.3.1.2b in the INRMP [Gene Stout and Associates]) are maintained and annually updated in Word® files within the DECAM. Previous lists are found in the GAP analysis report (species of special concern) (Canestorp 1997) and Shaw *et al*. (1989a, 1989b).

Special Interest Areas
Special interest areas on PCMS are shown in INRMP Figure 3.4.2.1b (Gene Stout and Associates 2002a).

The ***Soil Protection Area*** (20,696 acres) is an area of fragile soils. The Soil Protection Area was heavily damaged from overgrazing and drought before the land was acquired. The Soil Protection Area was off-limits to all training from 1983 until 1990 when it was open to dismounted-only training through 2004. However, since the land has recovered over the past 20 years, most of it was opened to mechanized military maneuver in January 2005. Much of the surface danger zone for the Proposed Action includes this area. Alternative F does not include this area.

Canyonlands (29,452 acres) along the Purgatoire River are off-limits to mechanized military maneuver and have very limited administrative vehicular access due to their fragile soils, cultural resources, steep topography, and wildlife/ecosystem values. Neither the Proposed Action nor Alternative F includes this area.

The ***Hogback*** (3,778 acres) is off-limits to mechanized military maneuver and has very limited administrative vehicular access, primarily due to its cultural resources but in part due to its overall ecosystem values. Neither the Proposed Action nor Alternative F includes this area.

The ***Wildlife Protection/Buffer Area*** (10,731 acres) is between the boundary fence and the legal property line. It is off-limits to military training. Neither the Proposed Action nor Alternative F includes this area.

No-dig Areas include all of the above areas on PCMS plus much smaller areas designed to protect isolated features. No-dig restrictions are imposed to protect cultural resources and sensitive soils. Alternative F includes some no-dig areas. The Proposed Action area does not include these areas.

Figure 4.7.1a Vegetation Potentially Affected by the Proposed Action

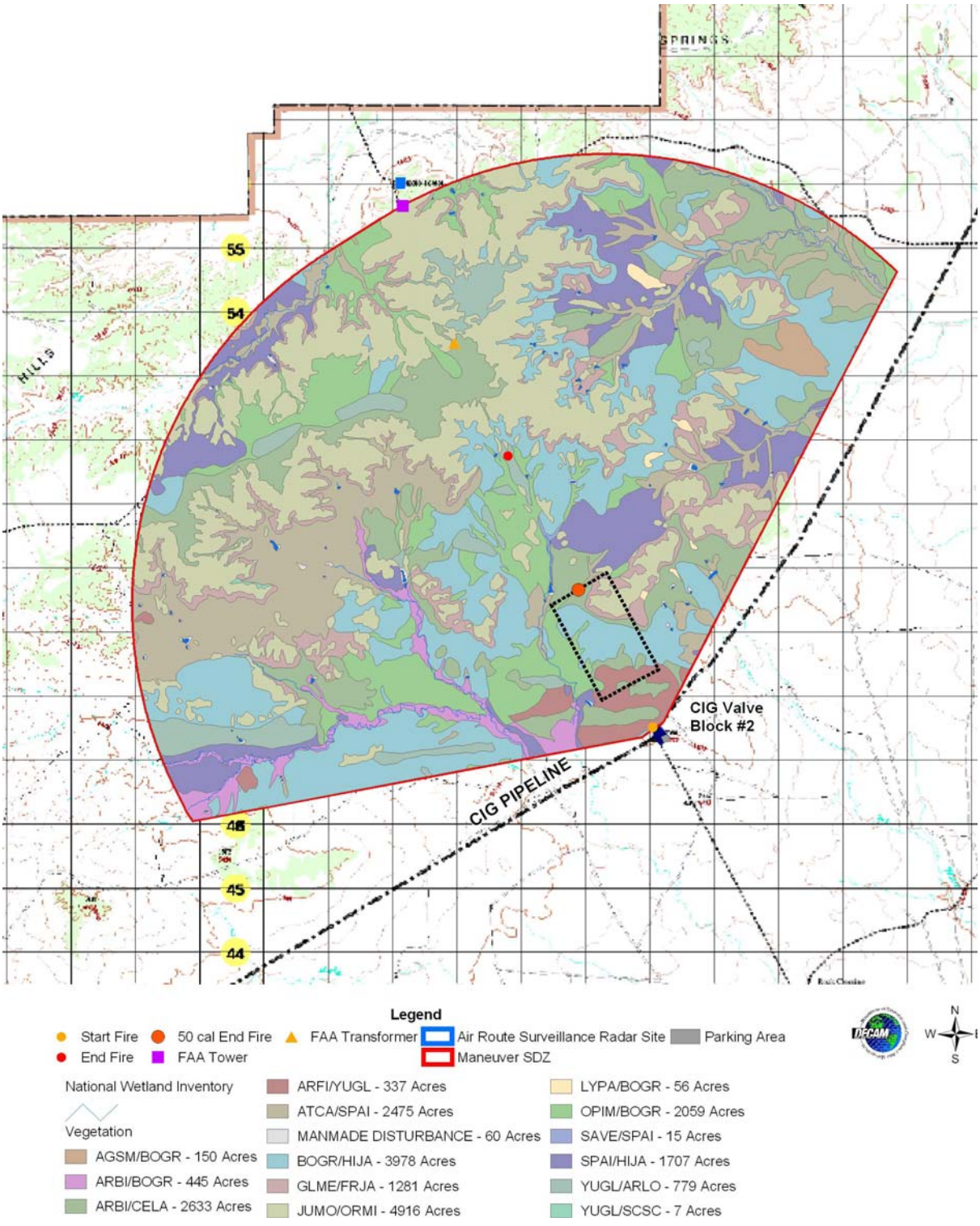
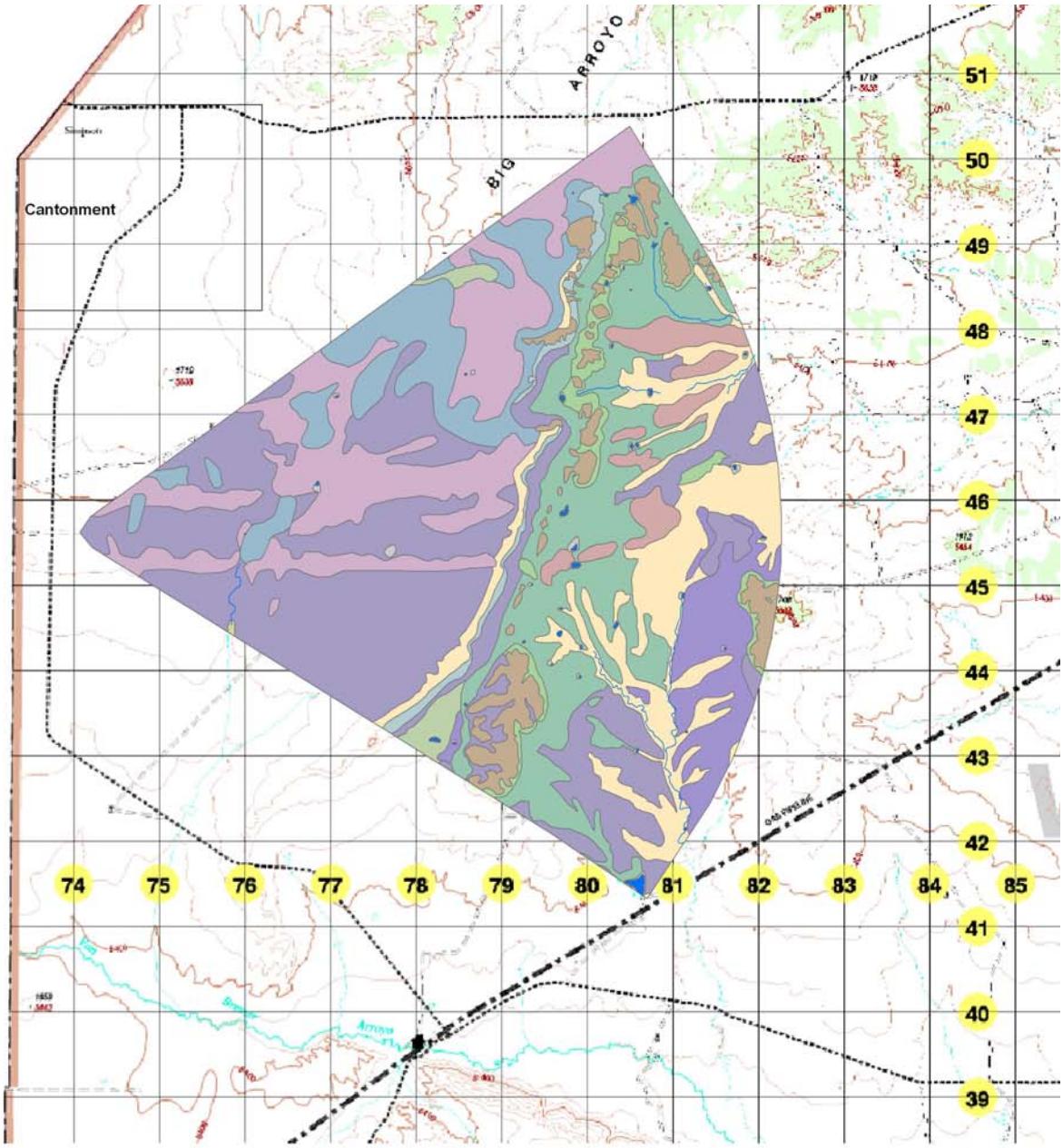


Figure 4.7.1b Vegetation Potentially Affected at the Alternative F Site



Legend

National Wetland Inventory

Alternative F Vegetation

- AGSM/BOGR - 3 Acres
- ARBI/BOGR - 1156 Acres
- ARBI/CELA - 829 Acres
- ARFI/YUGL - 320 Acres
- ATCA/SPAI - 1588 Acres
- BOGR/HIJA - 2969 Acres
- GLME/FRJA - 222 Acres
- JUMO/ORMI - 475 Acres
- MAN MADE DISTURBANCE - 42 Acres
- OPIM/BOGR - 109 Acres
- SPAI/HIJA - 518 Acres
- YUGL/ARLO - 1530 Acres
- YUGL/SCSC - 128 Acres

Table 4.7.1. Vegetation Potentially Affected By Proposed Projects

Plant Communities (Map Abbreviation)	Proposed Projects Acreage			
	Proposed Site (Acres)	Proposed Site (% of PCMS Total)	Alternative F (Acres)	Alternative F (% of PCMS Total)
western wheat grass/blue grama (AGSM/BOGR)	150	2%	3	<1%
Bigelow sagebrush/blue grama (ARBI/BOGR)	445	3%	1,156	8%
Bigelow sagebrush/winterfat (ARBI/CELA)	2,633	27%	829	8%
sand sagebrush/small soapweed (ARFI/YUGL)	337	40%	320	38%
fourwing saltbush/alkali sacaton (ATCA/SPAI)	2,475	25%	1,588	16%
disturbed (Anthro Disturb)	60	2%	42	1%
blue grama/galleta (BOGR/HIJA)	3,978	5%	2,969	4%
greasewood/James frankenia (GLME/FRJA)	1,281	34%	222	6%
one-seeded juniper/littleseed ricegrass (JUMO/ORMI)	4,916	33%	475	3%
pale wolfberry/blue grama (LYPA/BOGR)	56	59%	0	0%
tree cholla/blue grama (OPIM/BOGR)	2,059	8%	109	<1%
black greasewood/alkali sacaton (SAVE/SPAI)	15	3%	0	0%
alkali sacaton/galleta (SPAI/HIJA)	1,707	18%	518	5%
small soapweed/red threeawn (YUGL/ARLO)	779	9%	1,530	19%
soapweed/little bluestem (YUGL/SCSC)	7	2%	128	31%
Totals	20,898	9%	9,889	4%

Wetlands

The estimate of wetlands on the PCMS is 4,776 acres. PCMS wetlands are generally classified as either linear or isolated. Larger drainages, such as Van Bremer Arroyo, are classified as linear. Isolated wetlands are small, usually less than five acres, and normally are associated with erosion control dams in smaller, intermittent, eroded drainages. Wetlands have been mapped as part of the National Wetland Inventory, and representative areas are monitored on a regular basis for sediment. The most prominent wetland plant species are cottonwood trees, cattails, willow and salt cedar. Most wetlands on PCMS are associated with side canyons of the Purgatoire River and water developments.

About 57 acres of wetlands would be potentially affected by the Proposed Action. About 26 acres of wetlands would be potentially affected by Alternative F.

4.7.2 Environmental Consequences

Threshold of Significance
The threshold of significance for impacts to flora would be if the Proposed Action could cause fragmentation, loss, or degradation of high quality natural areas or sensitive sites; local extirpation of rare or sensitive plant species; a net loss of wetlands within installation boundaries (unmitigated); or the introduction or increased prevalence of undesirable non-native species.

Proposed Action

General Vegetation
Most effects would be in areas of facility and targetry construction (Bigelow sagebrush/winterfat, blue grama/galleta, and tree cholla/blue grama plant communities). Less than 10 acres of vegetation would be permanently denuded (building, road, and targetry footprints) by construction at the proposed live fire, maneuver range. Most of this acreage is now relatively undisturbed. Most damaged land would not be re-vegetated, as these features would be mostly permanent for the life of the range. Surrounding areas collaterally damaged and areas damaged by maneuver would be revegetated as part of the project with native seed mixtures. Direct effects would be minimal, if even detectable, at far extremes of safety fans due to almost all spent munitions landing well short of these extremes.

The potential for wildfires within the surface danger zone would increase due to the use of tracer ammunition and other pyrotechnics on the range. The amount of land affected and severity of wildfires due to range use would be dependent upon amount of moisture in plants and timing of training. The combination of fires caused by range operation and possibly prescribed burning to minimize fire escape risks would affect native vegetation, particularly tree cover, though grasses, forbs, and shrubs would increase. Reseeding would be needed in some areas. It should be assumed that much of the surface danger zone would be burned annually.

Wetlands
Of the 57 acres of National Wetland Inventory wetlands that would be potentially affected by the Proposed Action, about 34 acres (16 acres of PEMAh[7] - Palustrine, Emergent, Temporarily Flooded, Diked/Impounded and 18 acres of PEMCh - Palustrine, Emergent, Seasonally Flooded, Diked/Impounded) are associated with erosion control ponds. Other larger acreages of potentially affected wetlands are 12 acres of R4SBA (Riverine, Intermittent, StreamBed, Temporarily Flooded) and 8 other acres of other R4SB (Riverine, Intermittent, StreamBed). The remaining 3 acres are within 8 other classifications (all less than 1 acres).

Potential impacts would be non-explosive rounds landing in these wetland systems. These rounds would contain lead, which would gradually accumulate within the wetlands. Lead could affect waterfowl using these wetlands with the degree of effects determined by the amount of lead deposited, the degree to which waterfowl feed in bottom sediments, and the amount of bottom material ingested by individual birds. Waterfowl use of these areas is minimal.

Special Interest Areas
No special interest areas would be affected other than the Soil Protection Area, most of which was open to mechanized maneuver in January 2005.

No Action
Floral resources would not be affected by the No Action Alternative.

[7] Classified per Cowardin *et al*. (1979).

Alternative F – Static Ranges Overlay

General Vegetation
Most Alternative F effects would be in areas of facility and targetry construction (blue grama/galleta and small soapweed/red threeawn plant communities). Less than 10 acres would be permanently denuded (building, road, and targetry footprints) by construction. The discussion of the effects of the Proposed Action on vegetation is also pertinent to Alternative F. However, there would be less potential effects at the Alternative F due to a smaller surface danger zone and the use of many areas that have already been disturbed for construction and operation of the small arms static ranges (*e.g*., roads, firebreaks, parking area, towers). The total of new permanently denuded areas would be less than five acres.

Wetlands
Of the 26 acres of National Wetland Inventory wetlands that would be potentially affected by Alternative F, about 23 acres (including 18 acres of PEMAh[8] - Palustrine, Emergent, Temporarily Flooded, Diked/Impounded) are associated with erosion control ponds. Potential impacts would be the same as discussed for the Proposed Action.

Special Interest Areas
A fairly large No-dig area about 6,000 meters from the firing line would be affected by Alternative F. Potential impacts would be non-explosive rounds landing in this area. Physical and chemical effects of these rounds would be negligible, except for fire damage, which would be expected on an annual basis. No other special interest areas would be affected.

4.7.3 Cumulative Effects

Proposed Action
PCMS land condition (partially measured by vegetation) improved significantly from the time of Army acquisition through about 1992 and has been relatively stable or improving since then. However, Army occupation of PCMS resulted in relatively permanently changed vegetation where construction and associated development has occurred (*e.g*., cantonment area, combat landing strip, improved roads). The Proposed Action continues this process on those areas where the range tower, parking area, target berms, and roads would be located. This cumulative effect would not be significant.

Most effects to vegetation would be repaired if the facilities were ever removed. However, soil integrity would be damaged at road and facility sites, and this would make it difficult to naturally revegetate with native vegetation for a very long period. There would be a gradual accumulation of lead in wetlands within the surface danger zone with the amount of deposition dependent upon the distance and direction from targetry.

No Action
There is no cumulative effect on vegetation from the combined environmental effects of the No Action Alternative and those of past, present, and reasonably foreseeable future actions.

Alternative F – Static Ranges Overlay
The discussion of cumulative effects of the Proposed Action on vegetation is pertinent to Alternative F. However, there would be less potential cumulative effects at the Alternative F due to a smaller surface

[8] Classified per Cowardin *et al*. (1979).

danger zone and the use of some areas that have already been disturbed for construction and operation of the small arms static ranges (*e.g.*, roads, parking area, towers). There would be a gradual accumulation of lead in wetlands within the surface danger zone with the amount of deposition dependent upon the distance and direction from targetry.

4.7.4 Site-specific Mitigation

Proposed Action
Impact to vegetation from construction would be limited to areas of construction (*e.g.*, buildings, roads, parking areas, targets). Any incidental damage to other areas would be revegetated with native vegetation. Potential impacts from regular burning of range impact areas (largely due to tracer rounds) would be minimized by existing roads acting as firebreaks and the use of prescribed burning.

Prescribed burning would minimize risks of fires escaping the immediate area in front of the ranges. Prescribed burning would be accomplished using approved prescribed burn plans. The area would be periodically resurveyed for invasive (noxious) species. Control measures would be taken as required.

No Action
Vegetation mitigation would not be required.

Alternative F – Static Ranges Overlay
Site-specific mitigation for vegetation at Alternative F would be the same as for the Proposed Action except that mitigation for operation of the static small arms ranges would reduce the need for some additional mitigation for the live fire, maneuver range.

4.8 Fauna
Additional information regarding fauna on PCMS is in the INRMP (Gene Stout and Associates 2002a). Unless stated otherwise, below information is from that source.

4.8.1 Existing Conditions
Most vertebrate species indigenous to southeastern Colorado can be found on PCMS. Over 80 theses, dissertations, publications, and reports have been generated from studies of wildlife species at PCMS, as part of baseline studies required by the Environmental Impact Statement for Army use of these lands (U.S. Department of Army 1980). These studies, other surveys and research have continued to add to the PCMS species database and understanding of ecological processes on the PCMS, particularly effects of military activities. A list of wildlife species known to occur on PCMS is in the INRMP Appendix 3.3.2b (Gene Stout and Associates 2002a).

Important species of management concern are the pronghorn (*Antilocapra americana*), mule deer (*Odocoileus hemionus*), elk (*Cervus canadensis*), swift fox (*Vulpes velox*), black-tailed prairie dog (*Cynomys ludovicianus*), American Peregrine Falcon (*Falco peregrinus*), Texas horned lizard (*Phrynosoma cornutum*), coyote (*Canis latrans*), flathead chub (*Hybopsis gracilis*), Mountain Plover (*Charadrius montanus*), Ferruginous Hawk (*Buteo regalis*), Bald Eagle (*Haliaeetus leucocephalus*), and Golden Eagle (*Aquila chrysaetos*). Most management efforts since the Army acquired PCMS have been directed toward overall conservation of native fish and wildlife species and their habitats. PCMS currently contains no designated critical habitat or areas of critical environmental concern.

4.8.2 Environmental Consequences

Threshold of Significance
The threshold of significance for impacts to fauna would be if the Proposed Action could cause local population-level impacts (*e.g.*, potential to reduce local populations below self-sustaining levels, or long-term loss or impairment of substantial portions of local habitat [species-specific]) or direct impacts/ disturbance to birds protected by the Migratory Bird Treaty Act.

Proposed Action
Less than 10 acres of vegetation would be permanently denuded (building, road, and targetry footprints) by construction at the proposed live fire, maneuver range. Most of this acreage is now relatively undisturbed. Most damaged land would not be re-vegetated, as these features would be mostly permanent for the life of the range. Surrounding areas collaterally damaged would be revegetated as part of the project with native seed mixtures.

Figures 2.1a and 2.1b show the area along MSR 3 where live-firing would occur. Small arms fire (except .50 caliber weapons) would begin at the apex of the surface danger zone and continue to the base of the hill. The .50 caliber weapons would stop firing just past the building complex. The ridgeline would act as a natural backstop for most rounds fired. Thus, most of the direct firing damage to vegetation would occur in the area to the south of this ridgeline, with the degree of damage directly related to distance from the targets (buildings within the rectangle and targets placed on both sides of the road up to the ridge.

Direct effects would be minimal, if even detectable, at far extremes of safety fans due to almost all spent munitions landing well short of these extremes. The combination of fires caused by range operation and possibly prescribed burning to minimize fire escape risks would affect native wildlife habitat to some degree since it would be at levels higher than currently occurring. Greatest effects caused by fire would likely be to one-seeded juniper, which would likely be replaced by grasses and forbs in areas burned most regularly.

In addition, operation of the live fire, maneuver range would create disturbance. Most wildlife species would reasonably well adapt to this disturbance as has been shown by similar types of disturbance elsewhere on PCMS. There is the potential for inadvertent mortality of wildlife from live-fire operations. Experiences on other military installations, including Fort Carson, indicate that this type of mortality would not be significant.

No Action
Faunal resources would not be affected by the No Action Alternative.

Alternative F – Static Ranges Overlay
The discussion of the effects of the Proposed Action on faunal resources is pertinent to Alternative F. However, there would be less potential effects from Alternative F due to a smaller surface danger zone and the use of some areas that have already been disturbed for construction and operation of the small arms static ranges (*e.g.*, roads, firebreaks, parking area, towers). There are far fewer one-seeded juniper and other trees in this surface danger zone; thus, tree loss due to repeated burning would be less than at the Proposed Action site.

4.8.3 Cumulative Effects

Proposed Action

Army occupation of PCMS resulted in a loss of native wildlife habitat where construction and associated development has occurred (*e.g*., cantonment area, combat landing strip, improved roads). The Proposed Action continues this process on those areas where the range tower, parking area, target berms, and roads would be located.

This cumulative loss of wildlife habitat affects wildlife to some degree, but it would not be significant. Operation of the facilities also cumulatively affect wildlife, but experience on Fort Carson and other military installations has shown that wildlife species generally adapt to these types of disturbance.

Most effects to wildlife habitat would be repaired if the facilities were ever removed. However, soil integrity would be damaged at facility sites, and this would make it difficult to revegetate with native habitat for a very long period.

No Action
There would be no cumulative effects on fauna from the combined environmental effects of the No Action Alternative and those of past, present, and reasonably foreseeable future actions.

Alternative F – Static Ranges Overlay
The discussion of cumulative effects of the Proposed Action on faunal resources is pertinent to Alternative F. However, there would be less potential cumulative effects from Alternative F due to a smaller surface danger zone and the use of some areas that have already been disturbed for construction and operation of the small arms static ranges (*e.g*., roads, firebreaks, parking area, towers).

4.8.4 Site-specific Mitigation

Proposed Action
Effects to wildlife habitat from construction would be limited to areas of construction (*e.g*., range tower, roads, parking area, targets). Any incidental damage to other areas would be revegetated with native vegetation. The range would be visually inspected for wildlife prior to firing; any observed game mammals (primarily antelope and deer) would be hazed from the area. Firing would be stopped on live-fire ranges if terrestrial wildlife species were observed within targeted areas.

Implementation of a fire protection plan (Appendix B) would minimize risks of loss of wildlife habitat outside of the surface danger zone. The natural backstop, ridgeline, would minimize direct firing impacts beyond the line-of-sight of targets, but it would not minimize potential wildfire or prescribed burning habitat changes. Any damage downrange beyond the line-of-sight of targets (primarily north of the ridgeline) that potentially creates significant soil losses would be revegetated with native vegetation.

No Action
Fauna mitigation would not be required.

Alternative F – Static Ranges Overlay
Site-specific mitigation for faunal resources at Alternative F would be the same as for the Proposed Action except that mitigation for operation of the static small arms ranges would reduce the need for some additional mitigation for the live fire, maneuver range. There is also a downrange ridge about halfway from the apex of the surface danger zone at the Alternative F site; this ridge would act as a natural backstop for rounds fired.

4.9 Federal- and/or State-listed Species

Legal status for endangered or threatened species is designated by either the U.S. Fish and Wildlife Service (under the Endangered Species Act) or the Colorado Division of Wildlife (under Colorado Revised Statutes 33-2-105 Article 2). Section 7(a)(2) of the Endangered Species Act requires the Army to ensure that any Army action authorized, funded, or carried out is not likely to "jeopardize" the continued existence of any federal-listed species or result in the destruction or adverse modification of critical habitat (U.S. Army Corps of Engineers 1998).

4.9.1 Existing Conditions

Flora

No federal-listed (Endangered, Threatened, or Candidate) plant species are known to occur on PCMS. Section 3.3.1.3 in the INRMP (Gene Stout and Associates 2002a) lists the 19 state-listed Special Concern floral species found on PCMS. None of these species are known to be within the Proposed Action area or the Alternative F site.

Fauna

The ***Bald Eagle*** (federal-listed as threatened [defined as a species, subspecies, or variety likely to become endangered in the foreseeable future throughout all or a significant portion of its range]) is an uncommon winter visitor or resident on PCMS. It is the only federal-listed wildlife species known on PCMS. Its distribution is probably influenced by the location of prairie dog colonies. This species is often seen in Training Area 7, north of the Hogback. There are no training restrictions associated with the management of this species. The primary conservation activities associated with this species are actions reducing the risk of secondary poisoning. None of these species is known to regularly use the Proposed Action area or the Alternative F site.

INRMP Appendix 3.3.2b (Gene Stout and Associates 2002a) lists the 13 state-listed Special Concern faunal species found on PCMS. None of these are known to occur in either the Proposed Action site or Alternative F site.

4.9.2 Environmental Consequences

Threshold of Significance

The threshold of significance for impacts to federal- or state-listed species would be if the Proposed Action could cause local extirpation of rare or sensitive plant or animal species; permanent loss of habitat to a level below that required to achieve long-term federal-listed species population recovery objectives; any violation of federal-listed species requirements identified in a biological opinion; direct impacts/disturbance to candidate species for federal or state listing; a U.S. Fish and Wildlife Service jeopardy opinion; a statistically significant decline in reproductive success, direct mortality, or other unpermitted "take" of federal-listed species; and/or the loss of designated Critical Habitat.

Proposed Action

There would not be any significant effects on known federal- or state-listed plant or animal species or their habitats.

No Action

Federal- or state-listed species would not be affected by the No Action Alternative.

Alternative F – Static Ranges Overlay

There would not be any significant effects on known federal- or state-listed plant or animal species or their habitats.

4.9.3 Cumulative Effects

Proposed Action
Environmental effects from past and current Army actions, when added to the anticipated environmental effects of the Proposed Action, would not result in any significant effect on federal- or state-listed flora or fauna. Therefore, there would be no cumulative effect from the combined environmental effects of the Proposed Action and those of past, present, and reasonably foreseeable future actions.

No Action
There would be no cumulative effects on federal- or state-listed flora from the combined environmental effects of the No Action Alternative and those of past, present, and reasonably foreseeable future actions.

Alternative F – Static Ranges Overlay
There would be no cumulative effect from the combined environmental effects on federal- or state-listed flora at the Alternative F site and those of past, present, and reasonably foreseeable future actions.

4.9.4 Site-specific Mitigation

Proposed Action
Federal- or state-listed species mitigation would not be required.

No Action
Federal- or state-listed species mitigation would not be required.

Alternative F – Static Ranges Overlay
Federal- or state-listed species mitigation would not be required.

4.10 Cultural Resources

4.10.1 Existing Conditions
To date, a total of 3,397 archeological sites (and an additional 1,375 isolated finds) have been identified on the PCMS. Of these, 332 have been determined eligible for inclusion in the National Register of Historic Places (National Register). Eligible prehistoric sites number 140; eligible historic sites number 65. A total of 127 eligible sites are multicomponent, *i.e.* having both prehistoric and historic components (Cowen personal communication). Six National Register-eligible historic homestead districts have been identified on the PCMS (Gene Stout and Associates 2002b).

In summer and fall 2004, archaeological personnel from the Cultural Resources Management Program, DECAM conducted a pedestrian survey to complete the unsurveyed portion of the Proposed Action area for construction of a live fire, maneuver range. A total of 6,397 acres were surveyed, resulting in the identification of 43 new archaeological sites, all determined to be not eligible for inclusion in the National Register of Historic Places.

The Proposed Action encompasses a 20,900-acre area, which includes the surface danger zone. Within the total footprint, 12 sites have been identified that are currently eligible for inclusion in the National

Register. Of these sites, two are historic ranching/homestead complexes: Bar VI Ranch and portions of Burson Camp.

Most of Alternative F was surveyed prior to construction of the static, small arms ranges project (Gene Stout and Associates 2004). There are currently six sites within Alternative F that are eligible for the National Register, with 655 acres remaining to be surveyed and one Native American burial site.

Section 106 of the National Historic Preservation Act of 1966, as amended, and the 7th Infantry Division and Fort Carson Integrated Cultural Resources Management Plan, 2002-2006 require that Fort Carson:

- perform a cultural resource survey for unsurveyed areas that may be affected by this project, and
- consult with the Colorado State Historic Preservation Office, the Advisory Council on Historic Preservation, Native American tribes, and other consultation partners, as appropriate, prior to authorizing activities that may affect National Register-eligible resources.

Mitigation or alteration of proposed activities may result from consultation.

The Native American Graves Protection and Repatriation Act of 1990 requires agencies to inventory their collections, publish information, and then repatriate to the appropriate "culturally affiliated" Native American tribe all human remains and associated cultural items. The act also requires consultation with such tribe(s) prior to planned excavation, and in the case of an inadvertent discovery of human remains or their associated funerary objects, to stop work immediately to begin the consultation process. Fort Carson consults with 13 affiliated tribes (Gene Stout and Associates 2002b).

4.10.2 Environmental Consequences

Proposed Action
Construction and operation of a live fire, maneuver range could directly or indirectly damage cultural resources. Construction of roads, firebreaks, targetry, parking areas, etc. could affect surface and subsurface resources. Maneuver off-road could damage surface resources, and during wet weather, when ruts are created, could damage subsurface features. Direct fire could also damage cultural sites. Wildfires and prescribed burning could denude certain areas, creating erosion that could indirectly affect sites.

No Action
Cultural resources would not be affected by the No Action Alternative.

Alternative F – Static Ranges Overlay
The discussion of potential effects of the Proposed Action on cultural resources is pertinent to Alternative F.

4.10.3 Cumulative Effects

Proposed Action
Environmental effects from past and current Army actions, when added to the anticipated environmental effects of the Proposed Action, would not result in any significant effect to significant cultural resources. Therefore, there would be no cumulative effect from the combined environmental effects of the Proposed Action and those of past, present, and reasonably foreseeable future actions.

No Action
There is no cumulative effect on cultural resources from the combined environmental effects of the No Action Alternative and those of past, present, and reasonably foreseeable future actions.

Alternative F – Static Ranges Overlay
Environmental effects from past and current Army actions, when added to the anticipated environmental effects of using the Alternative F site for the live fire, maneuver range, would not result in any significant effect to significant cultural resources. Therefore, there would be no cumulative effect from the combined environmental effects of Alternative F and those of past, present and reasonable reasonably future actions.

4.10.4 Site-specific Mitigation

Proposed Action
As part of the Proposed Action, the Cultural Resources Management Program, DECAM would implement an archaeological testing/mitigation plan for the 12 National Register-eligible sites located within the proposed surface danger zone. The plan was submitted as part of a consultation letter to the Colorado State Historic Preservation Office on January 11, 2005. The plan and consultation letter (with concurrence from the Colorado State Historic Preservation Office) are in Appendix C. The Proposed Action would not become operational until all archaeological data recovery work is complete.

No Action
Cultural resources mitigation would not be required.

Alternative F – Static Ranges Overlay
As part of Alternative F, the Cultural Resources Management Program, DECAM would conduct a pedestrian survey of the 655 remaining unsurveyed acres. Subsequently, an archaeological testing/mitigation plan would be implemented for the six known National Register-eligible archeological sites located within the proposed surface danger zone, as well as any eligible sites identified during the final survey. As stated for the Proposed Action, the plan would be submitted as part of a consultation letter to the Colorado State Historic Preservation Office. The plan, consultation letter, and eventual concurrence from the Colorado State Historic Preservation Office, would be provided as Appendix C. All archaeological data recovery work would be completed prior to range use.

4.11 General Mitigation
Site-specific mitigation that is specifically designed to offset effects of the proposed construction and operation of a live fire, maneuver range at PCMS has been identified in previous discussions. However, much mitigation for the Proposed Action or any of its alternatives is accomplished in the form of general environmental management conducted by the 7th Infantry Division and Fort Carson as a requirement of using public lands for military activities. Most of these mitigation activities are based on national priorities, some of which are within legal instrumentalities (laws, executive orders, etc.) while others are under the category of stewardship. Compliance with some of these laws results in mitigation for the proposed construction/operation of a live fire, maneuver range at PCMS, even though such compliance activities may not have been specifically designed or funded for mitigation of the proposed reconstruction/operation of this range.

Specific examples of such general mitigation actions that affect the proposed construction/operation of a live fire, maneuver range at PCMS include the following:

- implementation of requirements within the acquisition Environmental Impact Statement (U.S. Department of the Army 1980);
- implementation of the *Integrated Natural Resources Management Plan* (Gene Stout and Associates 2002a);
- implementation of the *Integrated Cultural Resources Management Plan* (Gene Stout and Associates 2002b);
- compliance with the Sikes Act Improvement Act;
- implementation of local regulations (*e.g.*, 7th ID & Fort Carson Regulation 200-1, *Environmental Protection and Enhancement*; Fort Carson Regulation 350-10, *Maneuver Damage Control Program*; 7th ID & Fort Carson Regulation 200-6, *Wildlife Management*; 7th ID & Fort Carson Regulation 350-9, *Integrated Training Area Management (ITAM))*;
- implementation of the *Integrated Pest Management Plan* (7th ID and Fort Carson. 2001a);
- implementation of the *Prescribed Fire Plan* (Wolf 2004);
- implementation of the *Pollution Prevention Plan* (Aarcher, Inc. 2001); and
- implementation of the *Noxious Weed Management Plan* (7th ID and Fort Carson. 2001b).

5. SUMMARY OF EFFECTS AND CONCLUSIONS

5.1 Unavoidable Adverse Effects Should the Proposed Action Be Implemented

Some adverse effects due to construction cannot be avoided if the Proposed Action is implemented. Disturbance of soils and vegetation would occur, and these effects would be cumulative and long-term. There would be no effects to federal- or state-listed species. Noise effects of the live fire, maneuver range operation would not be significant off the installation. There is a minimal potential for the generation or discovery of hazardous waste or materials; such waste or materials would be disposed of or remediated according to compliance requirements.

Table 5.1 summarizes potential effects for each alternative, after mitigation. Environmental effects would not be significant within the larger geographic and temporal context in which they would take place.

Table 5.1. Summary of Potential Environmental Consequences

Resource Area	Environmental Consequences*		
	No Action Alternative	**Proposed Action**	**Alternative F**
Geology	No effect	No effect	No effect
Protection of Children	No effect	No effect	No effect
Land and Airspace Use (including outdoor recreation)	No effect	Minor loss of maneuver and hunting opportunities during range operation; airspace controlled during range firing	Very minor loss of maneuver and hunting opportunities during range operation; airspace controlled during range firing
Soils	No effect	Negative on construction sites	Negative on construction sites, but fewer acres affected
Air Quality	No effect	Slightly negative during construction, undetectable effects during operation	Slightly negative during construction, undetectable effects during operation
Noise Environment	No effect	No significant effect off-installation	No significant effect off-installation
Water Resources	No effect	No effect	No effect
Hazardous Waste/Materials	No effect	Lead deposition, little potential for migration	Additional lead deposition, little potential for migration
Floral Resources (including wetlands)	No effect	Negative at construction sites; negative downrange of firing ranges, particularly on trees; lead deposition in wetlands	Negative at construction sites, but fewer acres affected; negative downrange of firing ranges; lead deposition in wetlands
Faunal Resources	No effect	Slightly negative	Very slightly negative
Listed or Sensitive Species	No effect	No effect	No effect
Cultural Resources	No effect	No effect	No effect
Socioeconomic Environment	No effect	No effect	No effect

Resource Area	Environmental Consequences*		
	No Action Alternative	**Proposed Action**	**Alternative F**
Environmental Justice	No effect	No effect	No effect

* No effect: Actions have no known demonstrated or perceptible effects
Beneficial: Actions have apparent beneficial effects
Negative: Actions have apparent negative effects

5.2 Irreversible and Irretrievable Commitments of Resources

The Proposed Action would involve no irreversible or irretrievable commitment of resources other than the consumption of various expendable materials, supplies, and equipment associated with construction and operations and implementation of environmental mitigation measures.

5.3 Conclusions

The Proposed Action to construct and operate a live fire, maneuver range at PCMS was analyzed by comparing potential environmental consequences against existing conditions. Findings indicate that implementation of the Proposed Action would result in no significant adverse environmental consequences. The affected environment would not be significantly or adversely effected by proceeding with the Proposed Action. No significant cumulative effects would be expected.

Based on this environmental assessment, implementation of the Proposed Action (*i.e.*, construct and operate a live fire, maneuver range) would have no significant negative environmental or socioeconomic effects. Satisfaction of the Army's significant need to provide up-to-date and realistic training at PCMS is considered to outweigh the relatively minor environmental impacts, and significant damage mitigation would occur before and during range operation. The Proposed Action does not constitute a major federal action significantly affecting the quality of the human environment. Therefore, preparation of an environmental impact statement is not required, and preparation of a Finding of No Significant Impact is appropriate.

6. PERSONS CONTACTED – 7th ID AND FORT CARSON AND OTHER ARMY

Mary Barber - Deputy Director, DECAM
MAJ Ballard Barker - Fort Carson 7th ID Strategic Plans
Gary Belew - Chief, Natural and Cultural Resources Division, DECAM
Dan Benford - Deputy Range Manager, Range Division, G3/ Directorate of Plans, Training and Mobilization
Stephanie Carter – Environmental Restoration Coordinator, Environmental Compliance and Restoration Branch, DECAM
Pamela Cowen - Cultural Resources Manager, Conservation Branch, Natural and Cultural Resources Division, DECAM
Brian Goss - Training Requirements Integration/PCMS, Environmental Services Branch, Directorate of Environmental Compliance and Management
Russ Hamilton - Environmental Law Specialist, Staff Judge Advocate
Gary Hinds - Fort Carson G3/Directorate of Plans, Training and Mobilization, Aviation Safety
Nelson Kelm - Environmentalist (noise) (former), Prevention Branch, Environmental Compliance, Restoration and Prevention Division, DECAM
Jeffrey Linn - Chief, Environmental Services Branch, DECAM
Vicki McCusker - NEPA Coordinator, Environmental Services Branch, Directorate of Environmental Compliance and Management
Jim McDermott - Chief, Business and Environmental Services Division, DECAM
Linda Moeder - Geographic Information Specialist, Business and Administrative Services Branch, Directorate of Environmental Compliance and Management
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Robin Romero - NEPA project manager (former), Environmental Services Branch, DECAM
Robert C. Stack - Installation Range Manager, Range Division, G3/ Directorate of Plans, Training and Mobilization
Thomas L. Warren - Director, DECAM

7. EXTERNAL AGENCY COORDINATION

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Northwest Mountain Region Headquarters
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Colorado Springs, CO 80944
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9. ENVIRONMENTAL ASSESSMENT PREPARERS

This environmental assessment was prepared by Gene Stout and Associates, with support from the DECAM and G3/Directorate of Plans, Training, and Mobilization (see Chapter 6). Below are backgrounds of personnel within Gene Stout and Associates who either prepared or edited this assessment.

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10. ACRONYMS

AR	Army Regulation
CFR	Code of Federal Regulations
DECAM	Directorate of Environmental Compliance and Management
eSB	enhanced Separate Brigade
INRMP	Integrated Natural Resources Management Plan
mm	millimeter
MSR	Main Supply Route
NEPA	National Environmental Policy Act
U.S.	United States
USC	United States Code

APPENDIX A. Comments Received and Fort Carson Responses

Public meetings were held in La Junta (Student Center, Otero Junior College) and Trinidad (Sullivan Student Center) on February 1 and 2, 2005, respectively, to obtain public input regarding the Proposed Action. Meetings began with an explanation of the NEPA process and a short presentation of the history of Army use of PCMS. Personnel within the Directorate of Environmental Management and Compliance and G3/Directorate of Plans, Training and Mobilization then responded to public comments and provided further information on the Proposed Action.

The La Junta meeting was attended by 10 non-Fort Carson/PCMS persons representing landowners, Southern Colorado Livestock Association, the U.S. Forest Service, Federal Aviation Administration, U.S. Senator Allard's office, Pueblo Chieftain, and the general public. The Trinidad meeting was attended by 43 non-Fort Carson persons representing landowners, the U.S. Fish and Wildlife Service, Colorado Division of Wildlife, U.S. Senator Allard's office, Federal Aviation Administration, Historical Society, local businesses, Chronicle News, Pueblo Chieftain, Times Independent, Trinidad-Las Animas County Economic Development, Las Animas County, Trinidad Chamber of Commerce, Las Animas County Commissioners, OSH (Trinidad State Junior College), City of Trinidad, Trinidad Airport Manager, and the general public.

Some comments and concerns expressed by attendees were not related to the Proposed Action. These primarily centered future land acquisition. The Army responded that the Proposed Action included no new lands and if such actions were to be proposed in the future, they would be handled using the NEPA process, including public involvement.

Concerns expressed that were directly related to the Proposed Action involved the following.

- Would the Proposed Action affect Federal Aviation Administration facilities, including 24/7 opportunities to inspect them? No. The range would be shutdown if needed.
- Are there similar ranges on Fort Carson? Yes, three or four.
- Have troops been directly deployed from PCMS? Yes, smaller units.
- Would the Proposed Action result in prescribed burning? Yes, but similar to what is being done now.
- Why did the Army change its mind from its commitments in the original PCMS acquisition Environmental Impact Statement? Changing military requirements due to changing global threats.
- Would the Proposed Action increase PCMS employment levels? No, not in the foreseeable future. Range will be built self-help.
- Who determines significance of the Proposed Action? Garrison Commander.
- How do adjacent landowners feel about live fire on PCMS? A few to the north don't like it.
- What is timeline for Proposed Action? The very soonest range construction could start is 60 days. Likely to have firing on range in summer 2005.
- Would the Proposed Action create range use at night? Day and night.
- Do environmental safeguards during training affect our troops in battle? After mitigation, can train as fight except for safety issues on training range (can't shoot behind, pipeline, etc.). However, must sustain mission indefinitely; can't destroy land.
- How will the mitigation of the 12 cultural resources sites be accomplished? Data recovery in accordance with laws, standards, etc. Artifacts to be stored at Fort Carson approved curation facility, which is open to public for review and research.
- Any plans for barracks? No new permanent party in proposal.

- How many soldiers on range at one time? Up to 300 per month; no large unit training foreseen.
- What will be effects on hunting opportunities? Training will take priority. No projections on specific training schedules at this time.
- Any increase in traffic on pipeline road? No, all training will stay on PCMS.
- How much food and supplies for range will come from local sources? Most food, but not all, from Fort Carson. Army tries to buy PCMS supplies from local sources as much as possible, including materials for new range.
- Will Proposed Action affect public roads? It will be the same as for current deployments, wheeled vehicles by road convoys and tracked vehicles by rail.
- Why take down facilities after range use? To allow area to be used for large unit maneuver. Won't come down unless that is scheduled.
- Will PCMS create buffer zones or conservation easements? Will attempt to work with neighbors.
- Will there be night illumination? Yes, but minimal since illumination is often not favorable for U.S. forces that prefer dark.
- Any opportunities for mitigated cultural resources to stay in area for public (would help Trinidad economy)? If local communities can properly store them, options are open.
- When would larger weapons be fired on range? No weapons proposed over 81 millimeter mortars. Firing fans won't accommodate larger weapons.
- Will growth affect water? Water is taken from Trinidad reservoir. Army only using about half what is under contract. If expand use, public will be notified.
- What will be done to protect land? Can rest/rotate lands if beat up; can use dust palliatives. Army has programs to rehabilitate damaged lands.
- Will burning kill wildlife? Some losses possible; cool season burns don't damage soils and prevent fires from leaving PCMS.

The Army committed to addressing these concerns in its Environmental Assessment. There were several comments complimenting the Army for its stewardship at PCMS. It was noted that firing on the static ranges created minimal noise. Meeting announcements and signup sheets for both public meetings are stored at the Directorate of Environmental Compliance and Management.

The draft Environmental Assessment and Finding of No Significant Impact were made available for public review by placing them in the following locations: Colorado Springs, Penrose Public Library; Pueblo, Pueblo City-County Library; Trinidad, Carnegie Public Library, La Junta, Woodruff Memorial Library, Rocky Ford, Rocky Ford City Library; Walsenburg, Huerfano County Public Library, and PCMS Main Administration Building. These locations were provided using notices in the above list of venues. Copies were also made available to individuals by mail. The public notice period was March 14, 2005 to April 14, 2005.

The following letter was received as a result of this public review period. Fort Carson's response is also included.

Deb Owings
Bldg. 6236 DECAM
1634 Elwell Street
Ft Carson CO 80913

14 April 2005

Subject: Comments of Environmental Assessment for the Construction and Operation of Live Fire Maneuver Range Pinon Canyon Maneuver Area Colorado

1. **The spirit of the original PCMS EIS as referenced on page 1 of this EA that there will be no live fire at PCMS**. During the acquiring of PCMS and during many briefings, Ft Carson looked at people and said there will be no live fire at PCMS. There were also other things said that would not occur at PCMS such as no live fire, no battalion size units assigned at PCMS, no storage of nuclear waste and other things.
2. **The need for live fire ranges at PCMS has not been demonstrated.**

- The reason for the ranges expressed at the La Junta meeting so units could deploy from PCMS, there were no examples of units that were deployed from PCMS nor were there any future needs identified for the units that would deploy from PCMS.
- There were three other convoy ranges available at Ft Carson and there were no usage figures shown nor was it presented why more maneuver convoy ranges could not be built at Ft Carson. The range proposal at PCMS was it could be disassembled for maneuvers. Why could this not be done at Ft Carson.
- Ft Carson successfully deployed 30,000 without live fire at PCMS.
- Ft Carson and Senator Allard introduced a $30 million proposal to preserve land around Ft Carson to prepare Ft Carson for expansion by keeping the borders sparsely populated.
- The build it they will come, is the basis of building live fire ranges rather than actual and projected use Page 3 of this EA state the ranges will support Validation Annual Training should it occur in the future.
- Pg. 15 of this EA says Ft Carson is not meeting mission requirements of units training at PCMS. These live fire ranges will still not support all the training needs of units at PCMS. National Guard artillery units from La Junta still would not be able to fire their MLRS at PCMS. Saying a unit can do all there "summer" training at PCMS without having to go to Ft Carson was not addressed in this EA nor that the units will still come to Ft Carson to complete their training. The aspect of units doing all training at PCMS hasn't ~~even came close to being~~ been addressed in demonstrating the need for these ranges.

3. **The Piece mealing of PCMS was a one liner at the La Junta meeting. (The changing of PCMS a little at a time.**

- At the LaJunta meeting stated that PCMS was not being piece mealed in changes, yet the current actions and history shows differently. Originally there could be no maneuvers down range during April May and June and that was changed due to stewardship of the land. No 5tons or larger vehicles down range, this was changed. The soil protection area was set up because of the shallow soil yet now areas are being opened up for maneuver. The canyons are off limits due to sensitivity and now Sharps Canyon has major roads into the area. Recent live fire ranges have been constructed and now live fire maneuver range.
- This EA allows for future expansion without anymore reviews. Pg. 1 of this EA says usage will be 900-1200 soldier battalion and on Pg. 9 says brigade live fire troop use. Pg. 11 says 660 wheeled vehicles and 350 tracked vehicles with an 3 noted which note" probably smaller size units" a brigade size unit could live fire and maneuver. In this EA it noted helicopters mortars could be used also.
- Bob Stack range control Ft Carson said that there were letters sent out to acquire more land around PCMS but that was 10 years away.
- During the La Junta meeting is was stated that we are not trying to get live fire, we already did that, w are just wanting to maneuver and live fire.

4. Noise effect of live fire at PCMS is wrongly being recorded or represented.

- A study in the EA is referred to that was conducted it seems for the live fire ranges but seems to only address the actual noise increase of a shot and not to the live fire noises off post or the effects of multiple shots. The increase of no live fire to any live fire is a giant leap. The neighbors of PCMS were told there would be no live fire.
- Pg. 17 of this EA stated noise was not significant at the meeting. That is not what was said at the LaJunta meeting, the local rancher said he could hear the firing but what could he do, the army will do what it wants.
- Pg. 32 if this EA stated the Buffer Zone – is off limits to Military training – the noise of live fire violates this buffer zone concept.
- Pg. 46 of this EA states no significant noise effect off the installation. Ft Carson a post, which has been around a long time created with live fire, modifies its live fire and training to mitigate noise conflicts with off post. PCMS was created with no live and any live fire noise off post is significant.
- Pg. 55 of this EA states that a few landowners to the north of PCMS don't like live fire. This is not what was said by the landowner at the La Junta meeting, a landowner west of PCMS felt helpless because the army would due what they wanted to do.
- Pg. 56 of this EA – a question on creating buffer zones or conservation easement was asked and the answer the army would work with the neighbors. At Ft Carson there is a $30 million legislative action to deal with neighbors of Ft Carson and yet at PCMS it is said it will be worked out with the neighbors.
- Pg. 56 of this EA states live fire ranges created minimal noise is not accurate. Going from no noise and to live fire noise is a significant noise increase. The study reference did not show study's at neighbors but just the actual noise at the range.
- Pg 41 of this EA states no training live fire restriction of the eagle, the only federal wildlife listed animal , yet there has been no fly buffer zones around the nests due to noise. The studies of live fire noised effects on animals did not seemed to be studied in this EA nor I don't think it was studied in the original EIS for PCMS because there would be no live fire allowed at PCMS.

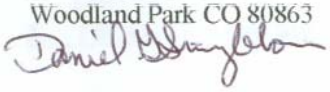
5. The effect of live fire on maneuver and recreation use is wrongly represented in the EA.

- During the La Junta meeting, Bob Stack of range control went around to the visitors talking with each to find out about them. When Bob found out I visited PCMS for hunting, Bob Stack immediately turned around and walked off and told Hanns (director of PCMS) to close PCMS to hunting.
- Pg. 46 of this EA states minor loss to hunting opportunities is totally wrong. Pg. 56 of this EA states Training takes priority over hunting.
- Pg. 21 and 22 of this EA states only 20,900 acres 9% of PCMS will be off limits, this is totally wrong. This is only the actual area of the range. History has shown that when live fire or even units not live firing or units just in the contonment area has closed PCMS to access totally or the entire west half of PCMS west of MSR 3 closed. The use of the live fire area will make more than the 20,900 acres off limits.
- There are study's or reductions in the number of limited hunting licenses available based on the fact of too many small animals are being shot. A factor not studied is the effect of live fire or unit use on hunting. People have waited 12 years to hunt on PCMS and at any day hunting could end. I better shoot this one I may not see another one. The statistics on antelope harvest will show the majority of animals are shot opening weekend and people are worried the area will close down at any time.
- Realizing training takes priority but the dates of at least deer and antelope can be project at least 5 years in the future and these two seasons are 22 days out of 365.
- The team effort of PCMS is not to encourage recreation access to PCMS. DECAM has to get involved at the directors level to make hunting access occur at PCMS instead of the entire PCMS team support the spirit of EIS for PCMS for allowing access to PCMS. The Behavior of Bob Stack at the LaJunta meeting dramatically demonstrates this anti access attitude.
- Access to Recreation is severely affected even without the live fire. Currently PCMS is only open during daylight hours Tuesday- Friday and closed on weekends. Not due to training needs but rather terrorist concerns. It just doesn't make sense that a security officer did an threat analyze to not allow access on weekends and at night due to the treat level. In order to gain access to PCMS one has to have a licensed vehicle, a registered weapon through the Ft Carson MP with back ground check ahead of time, an paid recreation pass from outdoor rec. on Ft Carson, a daily pass issued by PCMS, yet there

are multi keyed gates to various parts of PCMS. Unregistered vehicles to PCMS employees, open access to various college research teams during the summer, Non background checks for research teams and access by contractors. With the history of the concern of hunting for soldiers such as cow elk tags just for Ft Carson soldier, it just doesn't make sense to close PCMS a prime area for soldiers to hunt on their weekends off.

- The live fire maneuver range will be on MSR 3 the direct center of the major maneuver area for PCMS. The intersection of MSR 1 and 3 are in the impact area for the range, which is the only way to the east side of PCMS. A few vehicles use of the live fire maneuver range will close down PCMS not just the 20,900 acres of the range.

Daniel G Singleton
307 Dewell St
Woodland Park CO 80863



DEPARTMENT OF THE ARMY
HEADQUARTERS, 7th INFANTRY DIVISION AND FORT CARSON
FORT CARSON, COLORADO 80913-5000

REPLY TO ATTENTION OF:

May 4, 2005

Directorate, Environmental
Compliance and Management

Daniel G. Singleton
307 Dewell Street
Woodland Park, CO 80863

Dear Mr. Singleton:

I very much appreciate your letter of April 14, 2005 regarding the Environmental Assessment that Fort Carson prepared for the proposed construction and operation of a Live Fire, Maneuver Range on the Pinon Canyon Maneuver Site (PCMS). Considering the depth of your personal knowledge and prior military assignment at the PCMS, your views are important. Your letter and this response have been added to both the Environmental Assessment and the Administrative Record.

In many cases I agree with the spirit of your comments on the document and will ensure that the relevant activities are provided copies for their information and appropriate consideration. One of the main comments which was repeated several times during the various public meetings on this proposed action and those which over the last 18 years have preceded it, dealt with the original EIS and the public comments/commitments made in 1980. We both realize that the world and military training mission associated with the PCMS has changed considerably in the last 25 years. Regardless of the changes over the years, Fort Carson has consistently accomplished the requirements of the National Environmental Policy Act and implementing DOD Policy for each of these changes in due regard of our public resource stewardship mandates.

As the Global War on Terrorism and the transformation of the Force Structure continues to develop, it is my expectation that additional usage changes will likely be proposed for the PCMS as well. Change is inevitable, but I believe that Fort Carson in partnership with interested members of the public, such as yourself, will jointly continue to ensure the long term future resource sustainability of the Pinon Canyon Maneuver Site.

In response to specific aspects of your letter, it is true that Live fire is an aspect of military training that was not originally planned by the Army for the Maneuver Site. It is very difficult for us to specify military units and usage schedules for this range due to many uncertainties regarding demands on Fort Carson for both current and future military units. As has been the case, military training will continue to take priority and there could be additional effects of the use of this range on future multiple use recreational opportunities. Regardless and consistent with established policy, recreational access will continue to be allowed when both operational and security concerns can be accommodated.

In my opinion, adding additional supporting data regarding such issues as the need for using the PCMS for this training, effects of noise, effects on recreation, effects on trafficability, etc. would not change the conclusions of the Environmental Assessment. There is no evidence that any of these items would trigger an Environmental Impact Statement. Thus, the Army intends to move forward with the construction and operation of this range.

It is obvious that you spent a considerable amount of effort documenting your points, and I sincerely appreciate that effort. Awareness of your concerns will be helpful in making future decisions regarding use of the Pinon Canyon Maneuver Site. We appreciate thoughtful, constructive comments and suggestions, both supportive and critical, and encourage your continued participation as the situation might dictate. Again, thank you for your continued personal involvement.

Sincerely,

Thomas L. Warren
Director, Environmental
Compliance and Management

APPENDIX B. Controlled Firing Area Approval

U.S. Department of Transportation

Northwest Mountain Region
Colorado, Idaho, Montana, Oregon
Utah, Washington, Wyoming

1601 Lind Avenue S.W.
Renton, Washington 98055-4056

Federal Aviation Administration

In Reply refer to:
04-ANM-022-NR

TO ALL CONCERNED:

Subject: Establishment of Controlled Firing Area (CFA) at Pinon Canyon, Colorado (04-ANM-022-NR)

The Federal Aviation Administration (FAA) has reviewed a proposal to establish a Controlled Firing Area (CFA) at Pinon Canyon, Colorado.

The area is located within army owned/leased land. The description and boundaries of the CFA are as follows:

Name: PCMS Convoy Range Controlled Firing Area.

Description: Beginning at -- 37°27'12"/104°03'44"
37°28'56"/104°04'14"
37°31'09"/104°03'58"
37°32'49"/104°01'08"
37°33'24"/103°58'30"
37°32'25"/103°55'13"
37°28'08"/103°58'13"
to point of beginning.

Altitudes: Surface to 3,500 feet AGL.

Activity: Grenade, pistol, rifle, and machinegun qualification; 40MM Grenade Launcher, 9MM pistol, M4 and M16 rifle, and M2 machinegun.

Time of use: Daily, approximately 9 hours, between 0700 - 1900 local time, with occasional 24 hour usage; approximately 120 days per year.

Term of use: Effective until December 31, 2007.

Using Agency: U.S. Army, Ft. Carson, CO.

Safety Precautions:

a. Firing shall not be conducted when the ceiling is less than 1,000 feet above the maximum ordinate of fire or when visibility is less than 5 miles.

b. No projectile shall enter any cloud formation.

c. A designated Safety Officer shall ensure that all firing/detonation is ceased when aircraft approach the area. Designated observers shall have continuous and effective communication with the Safety Officer and shall notify the Safety Officer at any time an aircraft approaches the area. Designated observers shall be situated so as to permit observance of all air traffic within the entire CFA and for at least 5 miles beyond the periphery of the CFA.

d. The using agency shall determine if IR-110, IR-409, VR-1427, or Pinon One SKE Route are scheduled for use prior to conducting operations. The using agency shall not conduct operations when IR-110, IR-409, VR-1427, or Pinon One SKE Route are scheduled. For the IR-110 schedule, contact the 7th OSS/OSOS, Long Range Scheduling Office at DSN 461-3665 or commercial telephone (915) 696-3665. For the IR-409 and VR-1427 schedule, contact 140th Command Post at DSN 847-9955 or commercial telephone (720) 847-9955. For the Pinon One SKE Route schedule, contact the 302nd Airlift Wing at DSN 834-4416 or commercial telephone (719) 556-4416.

e. The using agency shall furnish the Denver FAA Automated Flight Service Station with the following information at least 24 hours prior to operations within the CFA:

(1) Location of the area.

(2) Time of use.

(3) Activities to be conducted.

(4) Maximum ordinate of fire.

(5) Using agency.

Kevin J. Nolan
Operations Support Specialist

Issued in Renton, Washington, on DEC 21 2004

APPENDIX C. Cultural Resources Mitigation Plan and Agency Consultation

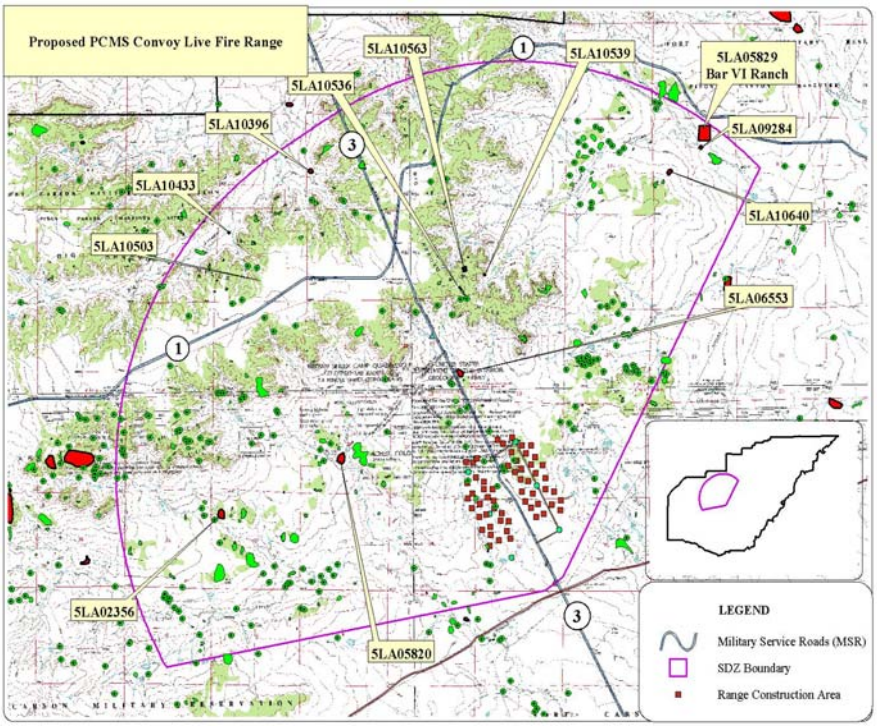
ARCHAEOLOGICAL TESTING/MITIGATION PLAN FOR NATIONAL REGISTER-ELIGIBLE SITES LOCATED WITHIN THE PROPOSED MANEUVER LIVE-FIRE RANGE CONSTRUCTION PROJECT AT THE FORT CARSON PINON CANYON MANEUVER SITE, LAS ANIMAS COUNTY, COLORADO

INTRODUCTION

The Department of the Army, the 7th Infantry Division, and Fort Carson propose to construct and operate a Maneuver Live-fire Range (MLFR) at the Piñon Canyon Maneuver Site (PCMS) in southeastern Colorado. This document outlines testing/mitigation plans for resolving the adverse effects of the proposed undertaking on twelve (12) archaeological sites currently considered eligible for inclusion in the National Register of Historic Places (NRHP) located within the proposed range construction area and Surface Danger Zone (SDZ) safety fan.

The PCMS has been managed by Fort Carson since 1983, and has primarily been used as a training area for mechanized tracked and wheeled vehicles, with helicopter and high-performance aircraft support. In the past twenty years, world events have changed the demands placed on military forces, and new facilities need to be constructed to support both current and future Army missions. The proposed live-fire range is designed to relieve the overload on facilities at Fort Carson, while filling the demand for a long distance firing range.

The Area of Potential Effect (APE) for the proposed action consists of the range construction area (to include building facades, target berms, and a communications tower), support roads, a parking area, a firebreak buffer, and the Surface Danger Zone (SDZ). The proposed range location is within the central and northwestern portions of the PCMS (Figure 1). The SDZ, defined as the area within which potential hazards exist from the firing of weapons, comprises most of the southern and eastern portions of the Big Arroyo Hills and the Bear Springs Hills.



In order to identify and re-evaluate sites within the APE, archival research on previously surveyed areas

and a pedestrian survey of unsurveyed parcels of land was conducted in the summer and fall of 2004.

Figure 1: Location of National Register-eligible sites within the proposed MLFR on the PCMS

A total of twelve (12) National Register-eligible archaeological sites were identified during the survey and archival investigation. Figure 1 shows the location of the sites within the SDZ.

Of the twelve (12) sites discussed in this mitigation plan, it is anticipated that eleven (11) will be adversely affected by the construction and use of the proposed firing range. (The potential for impact and the management strategy for the twelfth site, 5LA5829, Bar VI Ranch, are discussed on page 21 of this document.) Adverse effect is expected to occur from range and road construction, munitions impact, and heavy tracked and wheeled vehicle maneuvers.

The following details the proposed testing/mitigation tasks for the sites identified and determined eligible for inclusion in the NRHP within the proposed MLFR boundary. Each location is presented with accompanying site and feature descriptions and site-specific testing/mitigation tasks.

SITE 5LA2356

SITE DESCRIPTION:
Site 5LA2356 is a prehistoric use location recorded by the University of Denver in 1983. It is located within a rather substantial patch of juniper trees above the northern terrace of a large and unnamed watercourse in the upper Taylor Arroyo drainage system. Thatcher limestone outcrops throughout the area and forms low terraces within the site boundary. Typical of other prehistoric lithic scatters in this portion of the PCMS, 5LA2356 has a moderate density of surface artifacts in the form of debitage, chipped-stone tools, and ground stone. A single cache of manos was identified and designated as Collection Unit 7. One temporally datable projectile point was collected and is tentatively identified as a P42 type. According to Anderson (1989:162), these points were in use between AD 600 and AD 1600.

NRHP ELIGIBILITY RECOMMENDATION: Eligible

NRHP RECOMMENDATION JUSTIFICATION:
The site was nominated as eligible for inclusion in the NRHP under Criterion D, as it contains several areas with nebulous clusterings of fire-cracked rock. None of these rock groupings contain associated cultural material, but because the landform has good potential for preserving buried cultural deposits, it is possible that intact features will be encountered through excavation. As such, the site has good potential to yield additional information and/or diagnostic materials that can be used to address chronology, population dynamics, technology, and settlement and subsistence strategies.

PROPOSED MITIGATION TASKS:
1. SITE RE-SURVEY AND ARTIFACT RECORDATION
In 1983 a 100% surface collection of artifacts was performed. Since that time, additional artifacts and features are likely to have been exposed on the modern ground surface. Project archaeologists will check and/or re-establish the site boundaries, pin-flag surface artifacts, and intensively resurvey the areas of the site where fire-cracked rock concentrations were initially identified. Labor Estimate: Three (3) Person-hours.

2. DIGITAL MAPPING

The site will be digitally mapped in its entirety, including the site datum and boundary, feature locations, collected artifact locations, and landmarks or natural features. Photo locations, man-made disturbances, and all new shovel test or 1 x 1 meter excavation units will be included on the map. Labor Estimate: Twenty-four (24) Person-hours.

3. DIAGNOSTIC SURFACE ARTIFACT COLLECTION
All prehistoric surface artifacts will be located, pin-flagged, and collected in conjunction with digital mapping. Non-diagnostic surface artifacts will be recorded in the field using the format identified in Owens and Loendorf (2002: Appendices A, B, and C). Diagnostic surface artifacts will be collected and further analyzed in the laboratory using the codes in Owens and Loendorf (2002: Appendices D and E). Labor Estimate: Ten (10) Person-hours.

4. PHASE II SHOVEL TESTING
To assess the potential for buried cultural deposits, shovel test units will be hand excavated according to the methods described in Dean (1992:IV-21, Section f). Shovel tests will be laid out in a north-south orientated grid, spaced 4 meters apart. These test units will be excavated at ten (10) centimeter intervals and sediments removed will be processed through ¼ inch wire mesh. If the subsurface sediments are found to pre-date the prehistoric occupation of the site, or if buried sediments are encountered that are of mixed and secondary origin, DECAM archaeologists will terminate the probe grid. Conversely, if substantial cultural deposits are identified during testing, Phase II excavation using 1 x 1 meter units will be performed to determine the nature and extent of cultural materials and to recover subsurface site data.

Limestone bedrock outcrops throughout the site area. However, surface sediments appear to be at least twenty-five (25) centimeters deep in the areas between the outcroppings. To adequately sample the subsurface deposits, approximately seventy (70) shovel test units will need to be excavated, which are estimated to take .5 person-hours each. Labor Estimate: Thirty-five (35) Person-hours.

5. PHASE II EXCAVATION
Areas where fire-cracked rock concentrations were found will be excavated with 1 x 1 meter units. In addition, subsurface locations with significant cultural materials (identified by shovel tests) will require 1 x 1 meter excavation units to determine the richness of the archaeological deposits. It is estimated that a minimum of four (4) 1 x 1 meter excavation units will allow for data recovery from the site based on the information contained in the original site recording form completed by McCraley et al. (1983). Labor Estimate: Sixty (60) Person-hours.

6. PHASE III EXCAVATION OF SITE, IF APPLICABLE
Phase III (complete data recovery) will be required if additional significant cultural materials are identified during Phase II work.

TOTAL FIELD LABOR ESTIMATE FOR 5LA2356 (w/o Phase III): 132 Person-Hours

SITE 5LA5820

SITE DESCRIPTION:
The site is a historic homestead and a sparse prehistoric lithic scatter that was described by researchers from Gilbert/Commonwealth (Haynes and Bastian 1985:4-12) and Powers Elevation (1985:237-238). Larson-Tibesar archaeologists revisited the site in 1987 (Carrillo et al. 1987). The National Register-eligible portion of this site is only minimally connected with a more modern ranch known as Burson Camp. Marcos Salas acquired 316 acres of land from the government land office in Pueblo, Colorado,

in 1925. It is on this original patent that 5LA5820 was found, though it is unknown whether the main residence is attributable to this claim. In 1940 the property was under the control of Julius Gunter, Governor of Colorado from 1916-1918, and after that time the land was acquired by Ben Gutierrez. By the 1950s, the Dillingham family owned the property (Friedman 1985:237-238).

5LA5820 was found at the confluence of two small intermittent drainages in the grassy steppes south of the Big Arroyo Hills. The site and its components are spread over an area of approximately 4.45 acres. The terrain gently slopes from north to south, with thick alluvial gravels of up to two (2) meters comprising the south half of the site. The northern half exhibits shallow sediments and Greenhorn limestone bedrock outcrops in the area of the main house and along the site boundary. It is in the area of the limestone outcrops that prehistoric lithic artifacts were identified. The site is in a transitional area where both a juniper woodland and grassland plant species intermix.

The historic component of the site is dominated by a small structure which has been designated Feature 1. According to Haynes and Bastian (1987:4-12) this structure is set into the hill slope and has a shallowly curved, front-gable roof. The outside walls are of modified and unmodified stone slab construction with wall blocks stacked in a horizontal fashion. The north half of the feature is original construction, but a porch of more recent construction was built on the structure's south side. During this remodeling event, a concrete floor was poured into both halves.

A cement-poured cistern is located to the southeast of Feature 1. Designated Feature 2, it has a 1 x 1 meter cap exposed at the modern ground surface and below ground the diameter is at least eighty-five (85) centimeters. There is a date of what appears to be 1840 incised into the cement, although the original site recorders interpreted the inscription to read "January 8, 1940."

Feature 3 is a limestone foundation located northeast of Feature 1. Though adversely impacted by mechanized vehicle maneuvers, the foundation is of single course construction using spaced and unmodified slabs of limestone. The overall shape appears to have been rectangular, likely over three (3) meters in length. All other construction material appears to have been scavenged for reuse, but there is some trash in and around the foundation.

Features 4 (barn) and 5 (stable) are of more recent construction and are directly related to the modern ranch house (Burson Camp) found at the north end of the site. Corrals related to the latter features were designated Feature 6. Feature 7 is a pile of stones of unknown function.

A fairly diffuse scatter of historic trash is found throughout the site, with concentrations noted around Feature 1 and on the ridge at the northeast edge of the site. This trash includes bottle glass, tin cans of all sizes and functions, ceramic shards, shell casings, and nails.

NRHP ELIGIBILITY RECOMMENDATION: Eligible

NRHP RECOMMENDATION JUSTIFICATION:
Originally identified as Burson's Camp Archival Site #7 (Friedman 1985:237), the site was nominated as eligible for inclusion in the NRHP on the basis that it was likely to yield cultural materials useful for addressing regional topics such as chronology, settlement, economics, and culture. During the Larson-Tibesar project, the eligibility was reversed using a justification that all of the available data had been collected from the early features (Carrillo et al. 1987). As no actual subsurface testing was performed, it is recommended that Phase II work be conducted to assess and complete the data recovery.

PROPOSED MITIGATION TASKS:

1. SITE RE-SURVEY AND ARTIFACT RECORDATION
The surface artifacts have been adequately analyzed during previous work. As such, and because the site has been extremely well documented (Carrillo et al. 1987; Friedman 1985; Haynes and Bastian (1987), artifacts will not be re-recorded. In the proposed project, DECAM archaeologists will re-establish the site boundaries, and relocate all artifact concentrations, structures, and features. Labor Estimate: Three (3) Person-hours.

2. DIGITAL MAPPING
The site will be digitally mapped in its entirety, including the site datum location, site boundary, feature locations, collected artifact locations, landmarks or natural features, and all roads and fences. Photo locations, man-made disturbances, and any project shovel test or 1 x 1 meter excavation units will be included on the map. Labor Estimate: Thirty (30) Person-hours.

3. DIAGNOSTIC SURFACE ARTIFACT COLLECTION
As the surface artifacts have previously been recorded, no more artifact collection will be done. Labor Estimate: Zero (0) Person-hours.

4. PHASE II SHOVEL TESTING
To assess the potential for buried cultural deposits, shovel test units will be hand excavated according to the methods described in Dean (1992:IV-21, Section f). With bedrock outcropping over most of the northern portion of the site, testing in these locations would be futile. Sediments are deep in the southern portion of the site, but only relatively recent features are found there. Only in the area of Feature 1 (the house structure) and Feature 3 (the foundation), is there any potential for the recovery of buried occupation surfaces or additional cultural materials. Shovel tests will be laid out in a north-south orientated grid, spaced 4 meters apart. These test units will be excavated at ten (10) centimeter intervals and sediments removed will be processed through ¼ inch wire mesh. Only twenty (20) shovel test units will be required, estimated to take .5 person hours each. Labor Estimate: Ten (10) Person-hours.

5. PHASE II EXCAVATION
Though it has been determined unlikely, 1 x 1 meter units may need to be excavated depending on the nature of the soil deposits identified during shovel test work. Two (2) 1 x 1 meter excavation units, one in the area south of Feature 1 and another in Feature 3, should allow for adequate data recovery if this work is deemed necessary. Labor Estimate: Thirty (30) Person-hours.

6. PHASE III EXCAVATION OF SITE, IF APPLICABLE

Phase III (complete data recovery) will be required if additional significant cultural materials are identified during Phase II work.

TOTAL FIELD LABOR ESTIMATE FOR 5LA5820 (w/o Phase III): 73 Person-Hours

SITE 5LA6553

SITE DESCRIPTION:
Originally recorded by DECAM archaeologists in 1995, 5LA6553 contains two components: a prehistoric lithic scatter, possibly of Archaic age, and a light scatter of rather modern historic trash (tools, coat hanger, tin cans). All of these cultural materials were found on a low rise on the east edge of an intermittent arroyo near the intersection of MSR 3 and Burson Camp Road.

The terrain gently slopes to the west on this 2.1-acre site. Limestone bedrock outcrops at its west edge, and aeolian sediment deposits are found throughout the eastern half. Surface visibility is good throughout the area owing to the sparseness of the vegetation. Along with widely spaced juniper trees, patches of rice grass, grama grass, prickly pear, cholla, and yucca were recorded.

Most of the artifacts were found in a deflated context on bedrock exposures at the west edge of the site. Artifacts include debitage of basalt, chert, and limestone, ground stone, biface fragments, and a large projectile point. Activities inferred from the remains include food production and lithic reduction, but not food preparation, as thermal features and fire-cracked rock were not identified.

NRHP ELIGIBILITY RECOMMENDATION: Eligible

NRHP RECOMMENDATION JUSTIFICATION:
Though the site has a low artifact density, it was determined eligible for inclusion in the NRHP under Criterion D due to the presence of a possible Archaic-age projectile point and the potential for buried cultural deposits. Subsurface artifact contexts have the potential to address chronology, population dynamics, technology, settlement, and subsistence.

PROPOSED MITIGATION TASKS:
1. SITE RE-SURVEY AND ARTIFACT RECORDATION
A 100% surface collection of the diagnostic artifacts was done in 1995. As the area has been used for military training, additional artifacts and features may be exposed on the modern ground surface. DECAM archaeologists will check and/or re-establish the site boundaries, pin-flag additional diagnostic surface artifacts, and intensively re-survey the eastern edge of the site for features. Labor Estimate: Ten (10) Person-hours.

2. DIGITAL MAPPING
The site will be digitally mapped in its entirety, including its datum location, site boundary, feature locations, collected artifact locations, and landmarks or other natural features. Photo locations, man-made disturbances, and all new shovel test or 1 x 1 meter excavation units will be included on the map. Labor Estimate: Thirty (30) Person-hours.

3. DIAGNOSTIC SURFACE ARTIFACT COLLECTION
All prehistoric surface artifacts will be located, pin-flagged, and collected in conjunction with the digital mapping. Non-diagnostic surface artifacts will be recorded in the field using the format identified in Owens and Loendorf (2002: Appendices A, B, and C). Diagnostic surface artifacts will be collected and further analyzed in the laboratory using the codes in Owens and Loendorf (2002: Appendices D and E). Labor Estimate: Ten (10) Person-hours.

4. PHASE II SHOVEL TESTING
To assess potential buried cultural deposits throughout the site, shovel test units will be hand excavated across the eastern portion according to the methods described in Dean (1992:IV-21, Section f). Shovel tests will be laid out in a north-south orientated grid, spaced 4 meters apart. These test units will be excavated at ten (10) centimeter intervals, and sediments removed will be processed through ¼ inch wire mesh. If subsurface sediments are found to pre-date the site occupation, or if buried sediments are encountered that are of mixed and secondary origin, DECAM archaeologists may terminate the probe grid. Conversely, if substantial cultural deposits are identified during testing, then Phase II excavation using 1 x 1 meter units will be performed to determine the nature and extent of cultural materials. Limestone bedrock outcrops throughout the site and surface deposits are rather shallow. To adequately

test the nature of these deposits, approximately forty (40) shovel test units will be excavated, estimated to take .5 person hours each. Labor Estimate: Twenty (20) Person-hours.

5. PHASE II EXCAVATION
As no features were identified during the original site recording, excavation units are unlikely to be needed. However, if significant and undisturbed buried cultural deposits are identified in the probe grid, 1 x 1 meter units will be excavated to determine the richness of the archaeological deposits. Labor Estimate: Zero (0) Person-hours.

6. PHASE III EXCAVATION OF SITE, IF APPLICABLE
Phase III (complete data recovery) will be required if additional significant cultural materials are identified during Phase II work.

TOTAL FIELD LABOR ESTIMATE FOR 5LA6553 (w/o Phase III): 70 Person-Hours

SITE 5LA9284

SITE DESCRIPTION:
This site was originally recorded by archeologists from New Mexico State University and is a relatively sparse scatter of chipped-stone tools, debitage, and ground stone situated on a broad alluvial fan along the south side of Lockwood Arroyo. The site is bounded on the north, south, and east by the extent of the lithic artifacts, and on the west by a small erosional cut that flows north into Lockwood Arroyo. Topographic relief at the site is nominal, with a slight slope towards the north. There is a sparse covering of sagebrush, winterfat, grama grass, prickly pear, alkali sacaton, and juniper. The area of the site is 0.7 acres. There is significant soil deposition on site due to its location on an active alluvial fan. Sediment depths could reach well into the meters based on the arroyo cut, but cultural depth may be limited to thirty (30) centimeters.

Feature 1 is an area of fire-cracked rock and angular gravels approximately one (1) meter in diameter and was found at the eastern site boundary. No ash is visible at the surface of this feature, but it may have been flushed by rainwater erosion. One (1) quartzite chopping tool was present in the feature, and it does not appear to have been burned.

A total of twenty-six (26) pieces of chipped-stone debitage were recorded. Materials included quartzite, basalt, chert, and non-local Black Forest silicified wood. Most of the debitage are simple flakes, with a few complex flakes and shatter specimens recorded. There were twenty-two (22) non-cortical and four (4) cortical items. Based on the sparse data for the site, it appears that the debitage was generated using non-cortical cores that were likely reduced to produce expedient flake tools.

A single diagnostic projectile point was found at the southern edge of the site near the base of a low hill. This orthoquartzite point fragment is highly fractured but retains enough attributes to be assigned to Anderson's (1989) P26 type. A date range of 1000 BC to AD 500 is suggested for this class, placing the manufacture date between the Late Archaic and Developmental periods.

The remaining artifacts consist of a chopping tool, a fine-grained quartzite utilized flake, and five (5) sandstone slab metate fragments. The latter tools were recovered randomly from the site surface in no apparent concentration.

NRHP ELIGIBILITY RECOMMENDATION: Eligible

NRHP RECOMMENDATION JUSTIFICATION:
The site has been determined eligible for inclusion in the NRHP under Criterion D, as the area exhibits considerable deposition and there is a good probability of finding intact cultural deposits that may include pollen and macrobotanical remains. Test excavations in Feature 1 could yield datable carbon and other important data for the reconstruction of subsistence patterns and/or paleoenvironment. The single temporally diagnostic artifact has potential for addressing issues of chronology, and there is also a possibility of locating additional projectile points in a buried context. The presence of Black Forest silicified wood is potentially useful in addressing issues of trade and exchange or group mobility.

PROPOSED MITIGATION TASKS:
1. SITE RE-SURVEY AND ARTIFACT RECORDATION
The original site recorders collected 100% of the diagnostic surface artifacts, but additional artifacts and features are likely now exposed on the modern ground surface. DECAM archaeologists will check and/or re-establish the site boundaries, pin-flag surface artifacts, and intensively re-survey the areas of the site where cultural materials were originally identified. Labor Estimate: Eight (8) Person-hours.

2. DIGITAL MAPPING
The site will be digitally mapped in its entirety, including the site datum location, site boundary, feature locations, collected artifact locations, and landmarks or natural features. Photo locations, man-made disturbances, and all new shovel test or 1 x 1 meter excavation units will be included on the map. Labor Estimate: Twenty-four (24) Person-hours.

3. DIAGNOSTIC SURFACE ARTIFACT COLLECTION
All prehistoric surface artifacts will be located, pin-flagged, and collected in conjunction with the digital mapping. Non-diagnostic surface artifacts will be recorded in the field using the format identified in Owens and Loendorf (2002: Appendices A, B, and C). Diagnostic surface artifacts will be collected and further analyzed in the laboratory using the codes in Owens and Loendorf (2002: Appendices D and E). Labor Estimate: Five (5) Person-hours.

4. PHASE II SHOVEL TESTING
To assess potential buried cultural deposits, shovel test units will be hand excavated across the landform according to the methods described in Dean (1992:IV-21, Section f). Shovel tests will be laid out in a north-south orientated grid, spaced 4 meters apart. These test units will be excavated at ten (10) centimeter intervals, and sediments removed will be processed through ¼ inch wire mesh. If the subsurface sediments are found to pre-date the prehistoric occupation of the site, or if buried sediments are encountered that are of mixed and secondary origin, DECAM archaeologists will terminate the probe grid. Conversely, if substantial cultural deposits are identified during testing, Phase II excavation using 1 x 1 meter units will be performed to determine the nature and extent of cultural materials and to recover subsurface site data. Approximately forty (40) shovel tests units will need to be excavated, estimated to take .5 person hours each. Labor Estimate: Twenty (20) Person-hours.

5. PHASE II EXCAVATION
Feature 1, the thermal feature, will be excavated with a single 1 x 1 meter unit. In addition, subsurface locations with significant cultural materials identified through shovel tests will require additional 1 x 1 meter excavation units to determine the richness of the archaeological deposits. It is estimated that a minimum of two (2) 1 x 1 meter units will allow for data recovery from the site based on the information contained on the original site recording form. Labor Estimate: Thirty (30) Person-hours.

6. PHASE III EXCAVATION OF SITE, IF APPLICABLE

Phase III (complete data recovery) will be required if additional significant cultural materials are identified during Phase II work.

TOTAL FIELD LABOR ESTIMATE FOR 5LA9284 (w/o Phase III): 87 Person-Hours

SITE 5LA10396

SITE DESCRIPTION:
5LA10396 was recorded during the summer of 2004 by New Mexico State University. Found in the grassy prairie between the Radio Tower road and Big Arroyo in the central portion of the Big Arroyo Hills, the site is a historic homestead on land patented by William Hart in 1925. Cultural materials include a rather dense and restricted trash scatter, a dugout (Feature 1) with impressive stacked block architecture, and a pit of unknown function (Feature 2). These cultural materials were found on the north terrace of an intermittent arroyo in the upper Big Arroyo water drainage system. The .08-acre site is near the toe of a large alluvial fan, and sedimentary deposits of several meters are noted in the arroyo side wall at the south edge of the site. Located in a grassland plant community typical of the Big Arroyo Hills, surface plant species include cholla, grama grass, and sagebrush.

Feature 1 is a 17' x 14' dugout with double-wall construction comprised of modified and unmodified limestone blocks cemented by a mud mortar. The feature has not been completely filled by secondary sedimentation, and at least fourteen (14) courses are present. None of the roof elements are visible on the modern ground surface, but domestic trash within the depression suggests that a secondary trash-dumping episode occurred after the original site occupants vacated the structure. The feature seems to be in excellent condition, and likely contains intact cultural deposits below the modern ground surface.

Feature 2 is a 35' x 70' shallow depression with a few aligned stones and wood pieces around the perimeter. A more substantial depression is found within the first, measuring approximately 10' x 10.' Buried cultural deposits are likely capped within the feature, as alluvial deposits are visible at the surface.

Domestic trash, in the form of various bottle shards, a perfume bottle, a cold cream container, earthenware pieces, and tin cans, is found throughout the site with high densities between the features.

NRHP ELIGIBILITY RECOMMENDATION: Eligible

NRHP RECOMMENDATION JUSTIFICATION:
The majority of the site, including both cultural features, seems to be covered by slope wash deposits that may be covering intact cultural deposits. If so, artifacts recovered from subsurface context should address such issues of chronology, settlement, economics, demography, and culture. Given this archaeological potential, the site is eligible for inclusion in the NRHP under Criterion D.

PROPOSED MITIGATION TASKS:
1. SITE RE-SURVEY AND ARTIFACT RECORDATION
As the site was identified during the 2004 archaeological field season, all artifacts and features have been recorded to current state and Army standards. DECAM archaeologists will not need to re-survey the site or re-record artifacts. Labor Estimate: Zero (0) Person-hours.

2. DIGITAL MAPPING

The site will be digitally mapped in its entirety, including the site datum location, site boundary, feature locations, artifact locations, and landmarks or other natural features. All photo locations and project shovel test or 1 x 1 meter excavation units will be included on the map. Labor Estimate: Thirty-five (35) Person-hours.

3. DIAGNOSTIC SURFACE ARTIFACT COLLECTION
As the surface artifacts have been recently recorded, additional surface artifact collection is not necessary. Labor Estimate: Zero (0) Person-hours.

4. PHASE II SHOVEL TESTING
The site has the potential for buried cultural deposits. Shovel test units will be hand excavated around the site using the methods explained in Dean (1992:IV-21, Section f). The shovel tests will be laid out in a north-south orientated grid, spaced 4 apart. These test units will be excavated at ten (10) centimeter intervals, and sediments removed will be processed through ¼ inch wire mesh. If the subsurface sediments are found to pre-date the historic site occupation, or if buried sediments are encountered that are of mixed and secondary origin, DECAM archaeologists will terminate the probe grid. Conversely, if substantial cultural deposits are identified during testing, Phase II excavation using 1 x 1 meter units will be performed to determine the nature and extent of cultural materials and to recover subsurface site data. Fifty (50) shovel test units will need to be excavated, estimated to take .5 person hours each. Labor Estimate: Twenty-five (25) Person-hours.

5. PHASE II EXCAVATION
Both of the features will require substantial testing to determine their nature, significance, and condition. DECAM archaeologists will need to excavate four (4) 1 x 1 meter units in Feature 2, three (3) 1 x 1 meter units in Feature 1, and two (2) 1 x 1 meter units in the area of high artifact density. If the shovel probes uncover significant buried cultural deposits, additional 1 x 1 meter units will need to be excavated. Labor Estimate: One hundred and thirty-five (135) Person-hours.

6. PHASE III EXCAVATION OF SITE, IF APPLICABLE
Phase III (complete data recovery) will be required if additional significant cultural materials are identified during Phase II work.

TOTAL FIELD LABOR ESTIMATE FOR 5LA10396 (w/o Phase III): 195 Person-Hours

SITE 5LA10433

SITE DESCRIPTION:
Site 5LA10433 is a small historic homestead south of Big Arroyo's main channel in the central portion of the Big Arroyo Hills. It is on a gently sloping terrace and the terrain is highest along the southern site boundary. Surface vegetation is thick throughout the site with alkali sacaton, galleta grass, cholla, and prickly pear identified. Thick alluvial sediments are apparent on the landform, though Cretaceous age shales are only two (2) meters below the modern ground surface.

The site has a historic structure of wood and stone masonry that measures 16' x 16.' Wall blocks are constructed of locally available limestone chunks, some of which have been intentionally shaped, while others were used in their natural form. Some of the building materials may have been scavenged for use elsewhere, as there is no evidence of a roof covering. A light scattering of historic trash was found throughout the site and includes bottle glass shards, ceramic pieces, nails, a tobacco tin, a sanitary can, and part of a stovepipe. This site is located on land patented by Jose Andres Martinez in 1922. A

review of the 1920 Colorado census lists fourteen (14) different Jose Martinez' living in Las Animas County, Colorado. It is unknown which family actually homesteaded the parcel, as there are five (5) Jose A. Martinez' on the list.

NRHP ELIGIBILITY RECOMMENDATION: Eligible

NRHP RECOMMENDATION JUSTIFICATION:
There is good potential for buried deposits around the area of the house. As such, the site is eligible for inclusion in the NRHP under Criterion D. Artifacts recovered in buried context will aid in understanding regional historic economic activities, patterns of land ownership, land use, and demography.

PROPOSED MITIGATION TASKS:
1. SITE RE-SURVEY AND ARTIFACT RECORDATION
As 5LA10433 was identified during the 2004 archaeological field season, all artifacts and features have been recorded to current state and Army standards, and no new artifacts will have been exposed by erosion. DECAM archaeologists will not re-survey the site for additional features or re-record historic artifacts. Labor Estimate: Zero (0) Person-hours.

2. DIGITAL MAPPING
The site will be digitally mapped in its entirety, including the site datum location, site boundary, feature location, collected artifact location, and landmarks or natural features. Photo locations and any project shovel test or 1 x 1 meter excavation units will be included on the map. Labor Estimate: Thirty-two (32) Person-hours.

3. DIAGNOSTIC SURFACE ARTIFACT COLLECTION
As the surface artifacts have been recently recorded, it is unlikely that additional artifact collection will need to be done. Labor Estimate: Zero (0) Person-hours.

4. PHASE II SHOVEL TESTING
Alluvial sediments throughout the site are substantial, but it is doubtful that they post-date the historic cultural remains. As such, the alluvial deposits and overbank sediments from Big Arroyo may have capped cultural deposits. Shovel test units will be hand excavated according to the methods described in Dean (1992:IV-21, Section f). Shovel tests will be laid out in a north-south orientated grid, spaced four (4) meters apart. The test units will be excavated at ten (10) centimeter intervals, and sediments removed will be processed through ¼ inch wire mesh. If the subsurface sediments are found to pre-date the prehistoric or historic occupations of the site, or if buried sediments are encountered that are of mixed and secondary origin, DECAM archaeologists will terminate the probe grid. Conversely, if substantial cultural deposits are identified during testing, Phase II excavation using 1 x 1 m units will be performed to determine the nature and extent of cultural materials, and to recover subsurface site data. Twenty (20) shovel tests will need to be excavated, estimated to take .5 person hours each. Labor Estimate: Ten (10) Person-hours.

5. PHASE II EXCAVATION
The architectural feature will require Phase II excavation (limited testing) to determine the condition and level of significance. If areas outside of the architectural feature demonstrate substantial cultural depth and richness during shovel-testing, additional Phase II excavation units will be dug. It is estimated that four (4) 1 x 1 meter excavation units will allow for adequate data recovery in and around the main house feature. Labor Estimate: Sixty (60) Person-hours.

6. PHASE III EXCAVATION OF SITE, IF APPLICABLE
Phase III (complete data recovery) will be required if additional significant cultural materials are identified during Phase II excavation and testing.

TOTAL FIELD LABOR ESTIMATE FOR 5LA10433 (w/o Phase III): 102 Person-Hours

SITE 5LA10503

SITE DESCRIPTION:
5LA10503 is a 1920s historic homestead with a corral, a pit feature with associated window glass, and a burned structure (Feature 1). The site was identified at the base of a limestone-capped point at the southeast corner of the Big Arroyo Hills by New Mexico State University in 2004. The site is on a 360-acre parcel of land patented by Jesse E. Grever in 1925. In a search of the 1910 census, a Jesse E. Grever is listed as residing in Otero County, Colorado. Born in Oklahoma, Jesse is the son of John H. and Mary E. Grever and is a 15 year-old laborer working on a home farm. In the 1920 census, no Jesse Grever is found listed with the family.

In addition to the features listed above, the .74-acre site exhibits a significant amount of bottle, window, and milk glass on the surface and a light scattering of sanitary cans and ceramics around Feature 1. The corral is nothing more than a few downed fence posts and some smooth wire. The pit feature is a shallow depression with some wooden support posts, and sandstone and limestone blocks that formed supports for a sub floor. Measuring approximately 8' x 6', the feature size suggests it was manufactured to "prove up the claim" and was not intended for extended periods of habitation. There is no evidence of architectural elements. Areas of charcoal were noted on the modern ground surface, but it is unknown what part of the structure might have burned.

The site was found at the southwest corner of a large hill. Alluvial sediments of several meters in depth are found in this area, but it is unknown how much of these may be covering cultural materials. A grassland plant community dominates the landform with blue grama, galleta, snakeweed, and tumblegrass growing in rather dense patches.

A light prehistoric lithic scatter was identified among the historic remains, but it is not considered significant.

NRHP ELIGIBILITY RECOMMENDATION: Eligible

NRHP RECOMMENDATION JUSTIFICATION:
Alluvial sediments have washed off the hill slope behind and to the northeast of the site and have potentially covered intact cultural deposits. Both the pit and architectural features have recovery potential for archaeological material in subsurface contexts. 5LA10503 is therefore eligible for inclusion in the NRHP under Criterion D, as future information recovered from excavations may be used to address issues of early Euro-American settlement patterns and land use. Artifacts recovered in subsurface contexts may be useful for addressing topics like technology and subsistence practices.

PROPOSED MITIGATION TASKS:
1. SITE RE-SURVEY AND ARTIFACT RECORDATION
As 5LA10536 was identified during the 2004 archaeological field season, all artifacts and features have been recorded to current state and Army standards, and no new artifacts will have been exposed by

erosion. DECAM archaeologists will not re-survey the site for additional features or re-record historic artifacts. Labor Estimate: Zero (0) Person-hours.

2. DIGITAL MAPPING
The site will be digitally mapped in its entirety, including the site datum location, site boundary, feature locations, collected artifact locations, landmarks or natural features, and all roads and fences. Photo locations, man-made disturbances, and any project shovel test or 1 x 1 meter excavation units will be included on the map. Labor Estimate: Thirty-two (32) Person-hours.

3. DIAGNOSTIC SURFACE ARTIFACT COLLECTION
As the surface artifacts have been recently recorded, it is not likely that additional artifact collection will be done. Labor Estimate: Zero (0) Person-hours.

4. PHASE II SHOVEL TESTING
Alluvial sediments throughout the site are thick, but it is unlikely that they post-date the historic cultural remains. The terrain is generally steep, and historic features or prehistoric cultural materials may have been covered by natural erosional processes. To assess the significance and condition of the site deposits, shovel test units will be hand excavated according to the methods described in Dean (1992:IV-21, Section f). Shovel tests will be laid out in a north-south orientated grid, spaced four (4) meters apart. These test units will be excavated at ten (10) centimeter intervals, and sediments removed will be processed through ¼ inch wire mesh. If the subsurface sediments are found to pre-date the prehistoric or historic occupations of the site, or if buried sediments are encountered that are of mixed and secondary origin, DECAM archaeologists may terminate the probe grid. Conversely, if substantial cultural deposits are identified during testing, Phase II excavation using 1 x 1 meter units will be performed to determine the nature and extent of cultural materials. Thirty (30) shovel tests unites will need to be excavated, estimated to take .5 person hours each. Labor Estimate: Fifteen (15) Person-hours.

5. PHASE II EXCAVATION
The site and features require Phase II excavation (limited testing) to recover subsurface site data in order to determine the nature and level of significance. Areas that exhibit substantial cultural depth and richness during shovel testing may also require Phase II work. It is estimated that six (6) 1 x 1 meter test units will allow for adequate data recovery in and around the architectural feature and the pit feature. Because the corral has no potential for cultural depth, only shovel probes will be placed within its boundaries. Labor Estimate: Ninety (90) Person-hours.

6. PHASE III EXCAVATION OF SITE, IF APPLICABLE
Phase III (complete data recovery) will be required if additional significant cultural materials are identified during Phase II excavation and testing.

TOTAL FIELD LABOR ESTIMATE FOR 5LA10503 (w/o Phase III): 137 Person-Hours

SITE 5LA10536

SITE DESCRIPTION:
Site 5LA10536 is a prehistoric lithic scatter found on a flat-topped ridge at the southeast corner of the Big Arroyo Hills. Situated in a stand of thick juniper trees, the site and widely scattered artifact concentrations are commonly found on limestone bedrock outcroppings. The site is located in the juniper woodland plant community typical of the hills portion of the PCMS. Accompanying the juniper trees, rice grass, greasebush, winterfat, mountain mahogany, and grama grass were noted growing on

the surface in widely spaced groupings. Sediments are thin and exposed bedrock is common, even though areas of up to ten (10) centimeters of deposition were noted.

Prehistoric cultural materials include a well-defined, 94 x 86 centimeter hearth (Feature 1), a scattered grouping of fire-cracked rock, and a lithic scatter. Of the debitage, most pieces are related to early- and middle-stage raw material reduction activities. A ground stone mano and a metate were also identified.

NRHP ELIGIBILITY RECOMMENDATION: Eligible

NRHP RECOMMENDATION JUSTIFICATION:
An intact thermal feature identified during surface analysis was the only significant component of the site. Excavations in and around this feature are likely to yield chronological data, as well as information related to the reconstruction of subsistence patterns and/or paleoenvironment. Accordingly, the site is determined eligible for inclusion in the NRHP under Criterion D.

PROPOSED MITIGATION TASKS:
1. SITE RE-SURVEY AND ARTIFACT RECORDATION
As this site was identified during the 2004 archaeological field season, all artifacts and features have been recorded to current state and Army standards, and no new artifacts will have been exposed by erosion. DECAM archaeologists will not need to re-survey the site or re-record lithic artifacts. Labor Estimate: Zero (0) Person-hours.

2. DIGITAL MAPPING
The site will be digitally mapped in its entirety, including the site datum location, site boundary, feature locations, collected artifact locations, landmarks or natural features, and all roads and fences. Photo locations, man-made disturbances, and any project shovel test or 1 x 1 meter excavation units will be included on the map. Labor Estimate: Twenty-eight (28) Person-hours.

3. DIAGNOSTIC SURFACE ARTIFACT COLLECTION
As the surface artifacts have been recently recorded, it is not likely that additional artifact collection will be necessary. Labor Estimate: Zero (0) Person-hours.

4. PHASE II SHOVEL TESTING
As most of the site surface exhibits limestone bedrock exposures, the area of Feature 1 is the only location with the potential for cultural depth. Shovel test units will be dug around the feature in an attempt to locate buried prehistoric occupation surfaces. Utilizing this strategy, only eight (8) shovel tests will need to be excavated, estimated to take .5 person-hours each. Labor Estimate: Four (4) Person-hours.
5. PHASE II EXCAVATION
The thermal feature (Feature 1) will be excavated with a single 1 x 1 meter unit, which should effectively mitigate the site. If other buried features are identified during Phase II testing, additional 1 x 1 meter units will need to be dug. Labor Estimate: Fifteen (15) Person-hours.

6. PHASE III EXCAVATION OF SITE, IF APPLICABLE
Phase III (complete data recovery) will be required if additional significant cultural materials are identified during Phase II work.

TOTAL FIELD LABOR ESTIMATE FOR 5LA10536 (w/o Phase III): 47 Person-Hours

SITE 5LA10539

SITE DESCRIPTION:
5LA10539 contains two components. The first is a small and insignificant prehistoric lithic scatter, and the second is a large historic pit feature of unknown function with an associated trash scatter. The site was found in the grassy steppes east and below the southeast corner of the Big Arroyo Hills. The site occupies the top of an alluvial fan and a steep hill slope trends up to the mesa top at the northwest site boundary. Surface vegetation, in the form of blue grama, galleta grass, sand dropseed, and snakeweed, grows in sparse patches across the landform. Alluvial sediments are significant across the site with deposits of up to several meters possible.

The pit feature is likely a dugout/subterranean house. It measures approximately 16' x 12' and has limestone blocks for support walls and hand-cut juniper posts for roof support. In addition, twelve (12) evaporative milk cans and a metal and wood box were found on the modern ground surface. As construction elements are visible on the surface, it is possible that a floor artifact assemblage may be capped within the feature by post-abandonment sedimentation. This site is located on land that was patented in 1922 by a Lucien E. Wright. In a search of the 1910, 1920, and 1930 census reports, no person by this name was identified in any state.
NRHP ELIGIBILITY RECOMMENDATION: Eligible

NRHP RECOMMENDATION JUSTIFICATION:
Secondary alluvial sediments have washed down the hill slope on the west side of the site and have potentially buried intact cultural deposits in the area of the pit feature. Subsurface investigations in this locale are likely to uncover additional cultural materials, both historic and prehistoric. As such, the site is eligible for inclusion in the NRHP under Criterion D, because it has the potential to contribute information regarding regional settlement practices and patterns of land use.

PROPOSED MITIGATION TASKS:
1. SITE RE-SURVEY AND ARTIFACT RECORDATION
As the site was identified during the 2004 archaeological field season, all artifacts and features have been recorded to state and Army standards. DECAM archaeologists will not need to re-survey the site or re-record lithic artifacts. Labor Estimate: Zero (0) Person-hours.

2. DIGITAL MAPPING
The site will be digitally mapped in its entirety, including the site datum location, site boundary, feature locations, artifact locations, and landmarks or natural features. All photo locations and project shovel test or 1 x 1 meter excavation units will be included on the map. Labor Estimate: Twenty-eight (28) Person-hours.

3. DIAGNOSTIC SURFACE ARTIFACT COLLECTION
As the surface artifacts have been recently recorded, no further artifact collection will be done. Labor Estimate: Zero (0) Person-hours.

4. PHASE II SHOVEL TESTING
This site is on an active alluvial fan and there is potential for buried prehistoric deposits around the site and for historic deposits in the vicinity of the pit feature. Shovel test units will be hand excavated around the site using the methods described in Dean (1992:IV-21, Section f). Shovel tests will be laid out in a north-south orientated grid, spaced four (4) meters apart. The test units will be excavated at ten (10) centimeter intervals, and sediments removed will be processed through ¼ inch wire mesh. If the subsurface sediments are found to pre-date the prehistoric or historic occupations of the site, or if buried

sediments are encountered that are of mixed and secondary origin, DECAM archaeologists will terminate the probe grid. Conversely, if substantial cultural deposits are identified during testing, Phase II excavation using 1 x 1 m units will be performed to recover subsurface site data in order to determine the nature and extent of cultural materials. Twenty-five (25) shovel tests will need to be excavated, estimated to take .5 person-hours each. Labor Estimate: Twelve and a half (12.5) Person-hours.

5. PHASE II EXCAVATION
The pit feature will need to be excavated to determine the condition and level of significance. Four (4) 1 x 1 meter excavation units in and around the feature will be dug. Depending on the nature of the soil/sediment deposits identified during shovel testing work, additional 1 x 1 meter units may be necessary. Labor Estimate: Sixty (60) Person-hours.

6. PHASE III EXCAVATION OF SITE, IF APPLICABLE
Phase III (complete data recovery) will be required if additional significant cultural materials are identified during Phase II work.

TOTAL FIELD LABOR ESTIMATE FOR 5LA10539 (w/o Phase III): 100.5 Person-Hours

SITE 5LA10563

SITE DESCRIPTION:
The site is a large, dense lithic scatter with a thermal feature, a pit feature of unknown function, and an architectural feature. These cultural materials were identified on top of a juniper-covered, flat-topped ridge at the southeast corner of the Big Arroyo Hills, approximately 1.3 kilometers east/southeast of the intersection of MSRs 1 and 3. The landform primarily exhibits exposed limestone bedrock on the modern ground surface. Lithic artifacts were found randomly scattered across the site, with most in a deflated context.

A thermal feature, designated Feature 1, was found eroding out of the sidewall of a hill slope near Feature 2. It is a 3.6 x 3.4 meter cluster of fire-cracked rock, burned prehistoric artifacts, and a dark ash stain. This feature is thought to have several centimeters of intact deposits, but it is unknown whether it represents a large roasting pit or several small hearths in close association.

Feature 2 is an unusual arrangement of limestone blocks measuring 6 x 4.4 meters. It was found on an eroded limestone outcrop near the northeast edge of the site. There is no surface indication as to the nature, function, or chronology of this single coarse feature.

Feature 3 is located adjacent to Feature 2 and is dug into a slope on the northeastern edge of the site. It is a pit feature measuring 4.9 x 3.8 meters and the edges exhibit limestone slabs. The majority of the feature walls are degraded bedrock. There is potential for subsurface cultural deposits as erosional sediments have filled in this feature to an unknown depth.

NRHP ELIGIBILITY RECOMMENDATION: Eligible

NRHP RECOMMENDATION JUSTIFICATION:
Though it has eroded through time, the architectural feature (Feature 2) appears to have been originally constructed of unmodified limestone blocks. The period of construction is unknown, as both prehistoric and historic artifacts are absent from the immediate area. Secondary sedimentary infilling has likely preserved buried occupation surfaces and/or artifacts. The pit feature (Feature 3) has

associated limestone slabs, although no distinct pattern or arrangement has been ascertained. It is expected that excavations in the thermal feature (Feature 1) will produce datable charcoal and pollen, faunal, and macrobotanical remains. These are data useful for answering questions regarding regional chronology, settlement, and subsistence strategies. The site is therefore eligible for inclusion in the NRHP under Criterion D.

PROPOSED MITIGATION TASKS:

1. SITE RE-SURVEY AND ARTIFACT RECORDATION

As the site was identified during the 2004 archaeological field season, all artifacts and features have been recorded to current state and Army standards. DECAM archaeologists will not need to re-survey the site or re-record lithic artifacts. Labor Estimate: Zero (0) Person-hours.

2. DIGITAL MAPPING

The site will be digitally mapped in its entirety, including the site datum location, site boundary, feature locations, collected artifact locations, landmarks or natural features, and all roads and fences. Photo locations, man-made disturbances, and any project shovel test or 1 x 1 meter excavation units will be included on the map. Labor Estimate: Thirty (30) Person-hours.

3. DIAGNOSTIC SURFACE ARTIFACT COLLECTION

As the surface artifacts have been recently recorded, no more artifact collection will be done. Labor Estimate: Zero (0) Person-hours.

4. PHASE II SHOVEL TESTING

The entire site surface exhibits primarily limestone bedrock exposures. Only in the area of the features is there any evidence for potential cultural depth. Shovel test units will be hand excavated in the area of the features using the methods described in Dean (1992:IV-21, Section f). Shovel tests will be laid out in a north-south orientated grid, spaced four (4) meters apart. The test units will be excavated at ten (10) centimeter intervals, and sediments removed will be processed through ¼ inch wire mesh. If the subsurface sediments are found to pre-date the prehistoric or historic occupations of the site, or if buried sediments are encountered that are of mixed and secondary origin, DECAM archaeologists will terminate the probe grid. Conversely, if substantial cultural deposits are identified during testing, Phase II excavation using 1 x 1 m units will be performed to recover subsurface site data in order to determine the nature and extent of cultural materials. Twelve (12) shovel test units will need to be excavated, estimated to take .5 person-hours each. Labor Estimate: Six (6) Person-hours.

5. PHASE II EXCAVATION

A single 1 x 1 meter excavation unit should be sufficient to mitigate the thermal feature (other features will be tested using 1 x 1 meter units to assess the integrity and level of significance). Depending on the nature of the soil/sediment deposits identified during shovel testing work, additional 1 x 1 meter excavation units may be necessary. Labor Estimate: Fifteen (15) Person-hours.

6. PHASE III EXCAVATION OF SITE, IF APPLICABLE

Phase III (complete data recovery) will be required if additional significant cultural materials are identified during Phase II work.

TOTAL FIELD LABOR ESTIMATE FOR 5LA10563 (w/o Phase III): 51 Person-Hours

SITE 5LA10640

SITE DESCRIPTION:
This site was recorded by DECAM archaeologists on November 8, 2004. It is a large prehistoric lithic scatter of chipped-stone tools, debitage, and ground stone on the south side of upper Lockwood Arroyo in the area of the Bar VI Ranch. The site is situated on a broad alluvial fan that slopes gently from southwest to northeast. Grassland plant species grow on this landform with blue grama, galleta, snakeweed, and an occasional juniper tree observed. There is significant sediment deposition on site due to its geographic location, with depths of up to thirty-five (35) centimeters possible.

Feature 1 is an area of fire-cracked rock and angular gravels measuring 13 x 9 meters. From surface inspection it is impossible to determine whether this is a large roasting pit or a series of small hearths that blend together because of erosion. A shovel probe in this area revealed at least twenty-five (25) centimeters of cultural depth, and within the fill, pieces of charcoal, ground stone tools, and chipping debris were identified.

A total of thirty-six (36) pieces of chipped-stone debitage were recorded. Materials include quartzite, argillite, chert, orthoquartzite, and a piece of Jemez Mountain obsidian. Chipped tools included a hornfels/basalt drill tip, an argillite scraper, a fine-grained quartzite scraper, and two argillite utilized flakes. The ground-stone assemblage is abundant and includes nineteen (19) slab metate fragments, an edge-ground cobble, a complete mano, and two mano fragments. No temporal diagnostic pieces such as projectile points or ceramics were identified.

NRHP ELIGIBILITY RECOMMENDATION: Eligible

NRHP RECOMMENDATION JUSTIFICATION:
The site has been determined eligible for inclusion in the NRHP under Criterion D, as the landform exhibits considerable deposition and there is a good probability of finding intact cultural deposits that may include pollen and macrobotanical remains (especially with the abundance of ground stone). Test excavations in Feature 1 will yield datable carbon and other important data for the reconstruction of subsistence patterns and/or paleoenvironment. The presence of obsidian is potentially useful in addressing issues of trade and exchange or group mobility.

PROPOSED MITIGATION TASKS:
1. SITE RE-SURVEY AND ARTIFACT RECORDATION
DECAM archaeologists analyzed 100% of the surface artifacts. No further analysis is required. Labor Estimate: Zero (0) Person-hours.

2. DIGITAL MAPPING
The site will be digitally mapped in its entirety, including the site datum location, site boundary, feature locations, collected artifact locations, and landmarks or natural features. Photo locations, man-made disturbances, and all new shovel test or 1 x 1 meter excavation units will be included on the map. Labor Estimate: Twenty-four (24) Person-hours.

3. DIAGNOSTIC SURFACE ARTIFACT COLLECTION
All artifacts were recently recorded. Labor Estimate: Zero (0) Person-hours.

4. PHASE II SHOVEL TESTING
To assess potential buried cultural deposits, shovel test units will be hand excavated across the landform according to the methods described in Dean (1992:IV-21, Section f). Shovel tests will be laid out in a north-south orientated grid, spaced 4 meters apart. These test units will be excavated at ten (10) centimeter intervals, and sediments removed will be processed through ¼ inch wire mesh. If the

subsurface sediments are found to pre-date the prehistoric occupation of the site, or if buried sediments are encountered that are of mixed and secondary origin, DECAM archaeologists will terminate the probe grid. Conversely, if substantial cultural deposits are identified during testing, Phase II excavation using 1 x 1 meter units will be performed to determine the nature and extent of cultural materials and to recover subsurface site data. Approximately forty (40) shovel tests units will need to be excavated, estimated to take .5 person hours each. Labor Estimate: Twenty (20) Person-hours.

5. PHASE II EXCAVATION
Feature 1, the thermal feature, will be excavated with three (3) 1 x 1 meter units. In addition, subsurface locations with significant cultural materials identified through shovel tests will require additional 1 x 1 meter excavation units to determine the richness of the archaeological deposits. It is estimated that a minimum of three (3) 1 x 1 meter units will allow for data recovery from the site based on the information contained on the original site recording form. Labor Estimate: Forty-five (45) Person-hours.

6. PHASE III EXCAVATION OF SITE, IF APPLICABLE
Phase III (complete data recovery) will be required if additional significant cultural materials are identified during Phase II work.

TOTAL FIELD LABOR ESTIMATE FOR 5LA10640 (w/o Phase III): 89 Person-Hours

SITE 5LA5829 – Bar VI Ranch

5LA5829 is the Asa T. Haines Homestead, locally known as the Bar VI Ranch. It was originally recorded by archaeologists from Gilbert/Commonwealth in 1985 (Haynes and Bastian 1985:5-40–5-48). In 1987, Larson-Tibesar Associates (Carrillo et al. 1987) re-visited the site and completed a detailed map and a thorough artifact analysis. A Historic American Buildings Survey (HABS) was completed on the site in 1989 by the National Park Service. Since that time, Fort Carson has treated the Ranch as a historic district-eligible property.

As shown in the map on page 1 of this document, the ranch is located on the north/northeast periphery of the APE. Due to the distance from the proposed range's firing center, and the variances in terrain elevation between the range and the ranch, it is Fort Carson's position that the site has little potential for significant adverse impacts during military use of the range. In addition, the site's size and architectural/archaeological complexity indicate that Phase II testing/mitigation efforts would be extensive, requiring the expenditure of substantial personnel and fiscal resources. As such, Fort Carson proposes to monitor the site during the first military use of the proposed range. If the site is found to have been impacted at that time, testing/mitigation efforts as detailed below will be completed prior to further use of the range.

SITE DESCRIPTION:
The site was encountered on the north terrace of Lockwood Arroyo, in the upper drainage basin east of the Big Arroyo Hills and south of the Bear Springs Hills. It extends over an area of 13 acres and the terrain ranges from low hills along the north boundary, to deeply incised arroyos at the south. Alluvial sediments in the form of channel cut-and-fill sequences are thick, indicating the potential for subsurface cultural remains. Surface vegetation is dominated by shrubland species such as saltbush, wolfberry, and rabbitbrush, but juniper trees, alkali sacaton, wheatgrass, winterfat, and the *Opuntias* are also found in varying amounts.

A total of six (6) features comprise the main portion of the site: a main house (Feature 1, Larson-Tibesar), a dugout (Structure B according to Gilbert/Commonwealth), a chicken coop (Feature 2, Larson-Tibesar), a feature interpreted as a stable/garage (Feature 4, Larson-Tibesar), a privy (Feature 3, Larson-Tibesar), and corral complexes (Features 5 and 6, Larson-Tibesar). The main house is a one-story rectangular structure made of adobe bricks. It opens to the south with windows along the back walls. The dugout is attached to the northeast corner of the main house and functioned as a root cellar. It was constructed by the Kitch family around 1930 (Haynes and Bastian, 1985:5-47). The feature opens to the south, with stucco-covered adobe brick walls, and has a wooden roof covered with dirt. The chicken coop is almost completely collapsed. It is constructed of railroad ties, adobe brick, unmodified fieldstones, wood planks, and chicken wire mesh. The privy is essentially intact and is made of wood planks, juniper poles, and roof paper. The garage/stable is a more modern feature, constructed of unmodified fieldstones, juniper logs, sheet metal, and dirt.

A fairly diffuse scatter of historic trash is found throughout the area with concentrations noted around the main architectural elements. The trash is comprised of bottle glass, tin cans of all sizes and functions, machinery parts, ceramic shards, cartridges, and nails.

NRHP ELIGIBILITY RECOMMENDATION: Eligible as a Historic District
NRHP RECOMMENDATION JUSTIFICATION:
Friedman (1985:251-253) nominated the Bar VI Ranch (Archival Site #18) as eligible for inclusion in the NRHP under Criteria A, B, and D. It is associated with persons important in regional history, such as Asa Haines, the Taylor family, the Cross family, and the Kitch family. Artifacts encountered in buried context will be useful for addressing regional topics like chronology, settlement, economics, and culture. During the Larson-Tibesar project, the eligibility recommendation was upheld, but archaeological potential and significance was said to be low due to the ranch's sustained occupation and reuse through time (Carrillo et al. 1987).

PROPOSED MITIGATION TASKS:
1. SITE RE-SURVEY AND ARTIFACT RECORDATION
Past archaeologists have done an adequate job of analyzing the surface artifacts recovered on the site. As such, and because the site has been well documented (Carrillo et al. 1987; Friedman 1985:251-253; Haynes and Bastian 1987:5-40 – 5-48), artifacts will not be re-recorded. In the current proposed project, DECAM archaeologists will re-establish the site boundaries and relocate all artifact concentrations, structures, and features. Labor Estimate: Fifteen (15) Person-hours.

2. DIGITAL MAPPING
The site will be digitally mapped in its entirety, including site datum location, site boundary, feature locations, collected artifact locations, landmarks or natural features, and all roads and fences. Photo locations, man-made disturbances, and any project shovel test or 1 x 1 meter excavation units will be included on the map. Labor Estimate: Thirty-four (34) Person-hours.

3. DIAGNOSTIC SURFACE ARTIFACT COLLECTION
As the surface artifacts have already been recorded, no more artifact collection will be done. Labor Estimate: Zero (0) Person-hours.

4. PHASE II SHOVEL TESTING
As there is some question as to the site's integrity, shovel test units will be hand excavated in an attempt to determine the nature of the sediments, and to determine if remains from the early occupations of the site remain intact. Sediments are deep over the entire site area and most of the features have excavation potential. Shovel tests will be laid out in a north-south orientated grid, spaced

four (4) meters apart. The site area is over 6.6 acres in size. Therefore, a large number of shovel test units will be necessary. Minimally, 130 shovel tests will be required, estimated to take .5 person-hours each. Labor Estimate: Sixty-five (65) Person-hours.

5. PHASE II EXCAVATION
In the six (6) features comprising the site, only four (4) will require Phase II testing: the dugout (four (4) 1 x 1 meter units), the chicken coop (one (1) 1 x 1 meter unit), the stable/garage (four (4) 1 x 1 meter units), and the privy (one (1) 1 x 1 meter unit). The main house and the corrals have low archaeological potential. Depending on the nature of the soil deposits identified during shovel testing work, additional 1 x 1 meter excavation units may be necessary. Labor Estimate: One hundred and eighty (180) Person-hours.

6. PHASE III EXCAVATION OF SITE, IF APPLICABLE
Phase III (complete data recovery) will be required if additional significant cultural materials are identified during Phase II work. Should Phase III work be necessary, it is estimated that the data recovery would require the placement of over 100 excavation units.

TOTAL FIELD LABOR ESTIMATE FOR 5LA5820 (w/o Phase III): 294 Person-Hours

SUMMARY

The determination of an acceptable level of data recovery for archaeological mitigation work has not been quantified in any document (e.g., the excavation of 35% of all features and occupation surfaces will effectively mitigate a site). Each site is a unique entity, varying in nature and complexity, size, integrity, context, and research potential. In this mitigation plan, the majority of the work has been considered Phase II (subsurface testing), as the nature, extent, and integrity of buried site deposits is unknown. It is anticipated that this level of testing will effectively mitigate each site if no additional buried cultural deposits are identified. In cases where significant deposits are encountered in subsurface context, Phase III data recovery will proceed. In the unlikely event that archaeological resources are found to include human remains, procedures will be initiated as outlined in the Fort Carson NAGPRA SOP (Standard Operating Procedures) and the 2004 Comprehensive Agreement between Fort Carson and Native American Tribes claiming cultural affiliation with lands administered by Fort Carson.

The person-hours estimated in this document are summarized in the table below, and are based on Phase II work only. It is estimated that testing/mitigation work for the first eleven (11) sites listed will require 1083.5 person-hours (30.09 field days with a four-person crew). In the event that site 5LA5829, Bar VI Ranch, needs further testing/mitigation work, an additional 294 person-hours (8.2 field days) will be required.

Site Component and Mitigation Estimates

Site Number	Site Type	Site Period	Features	Labor Estimate (Person-hours)
5LA02356	Prehistoric	Undated	0	132
5LA05820	Multicomponent	1930 - 1941/Historic; Undated Prehistoric	7	73
5LA06553	Prehistoric	Archaic (7800 - 1850 BP)	0	70

5LA09284	Prehistoric	Late Archaic to Developmental (3000 - 900 BP)	1	87
5LA10396	Historic	1917 - 1983	2	195
5LA10433	Historic	1917 - 1983	1	102
5LA10503	Historic	1917 - 1983	3	137
5LA10536	Prehistoric	Undated Prehistoric	1	47
5LA10539	Multicomponent	1917 - 1983/Historic; Undated Prehistoric	1	100.5
5LA10563	Prehistoric	Undated Prehistoric	3	51
5LA10640	Prehistoric	Undated Prehistoric	1	89
		Sub-total		**1083.5**
5LA05829	Historic	1917 – 1983/Historic; Bar VI Ranch	6	294
		Total		**1377.5**

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DEPARTMENT OF THE ARMY
HEADQUARTERS, 7th INFANTRY DIVISION AND FORT CARSON
FORT CARSON, COLORADO 80913-5000

REPLY TO
ATTENTION OF

January 11, 2005

Directorate of Environmental Compliance and Management

Subject: Archaeological Testing/Mitigation for Sites within Proposed Maneuver Live-Fire Range, Pinon Canyon Maneuver Site

Ms. Georgianna Contiguglia
State Historic Preservation Officer
Colorado Historical Society
1300 Broadway
Denver, Colorado 80203-2137

Certified Mail Return
Receipt No. 7000 1670 0009 1746 3744

Dear Ms Contiguglia:

Fort Carson has initiated a construction project to build a Maneuver Live-fire Range (MLFR) on the training facility at the Pinon Canyon Maneuver Site (PCMS) in southeastern Colorado. Archival research and an archaeological survey of the unsurveyed portions of the construction footprint were conducted in the summer and fall of 2004. The twelve (12) sites listed in the following table were identified within the Area of Potential Effect (APE), and are considered to be eligible for inclusion in the National Register of Historic Places as defined in 36 CFR 60.

Site Number	Site Type	Site Period
5LA02356	Prehistoric	Undated
5LA05820	Multicomponent	1930 - 1941/Historic; Undated Prehistoric
5LA05829	Historic	1917 - 1983/Historic; Bar VI Ranch
5LA06553	Prehistoric	Archaic (7800 - 1850 BP)
5LA09284	Prehistoric	Late Archaic to Developmental (3000 - 900 BP)
5LA10396	Historic	1917 - 1983
5LA10433	Historic	1917 - 1983
5LA10503	Historic	1917 - 1983
5LA10536	Prehistoric	Undated Prehistoric
5LA10539	Multicomponent	1917 - 1983/Historic; Undated Prehistoric
5LA10563	Prehistoric	Undated Prehistoric
5LA10640	Prehistoric	Undated Prehistoric

It is the determination of Fort Carson's Cultural Resources Manager (CRM) that this project constitutes an undertaking in accordance with Section 106 (36 CFR 800) of the National Historic Preservation Act (NHPA), and that the intense military activity that will take place on these ranges will have an adverse effect upon the eligible sites identified within the APE. As such, a plan (Enclosure 1) has been developed in order to perform Phase II testing and Phase III mitigation (where required) on these sites. Fort Carson requests your concurrence with this plan and the data

recovery efforts specified within. The identification and consultation requirements associated with this effort will also be defined in Sections 4.10.2 and 4.10.4 of the Environmental Assessment (EA) for the construction of this range (currently in draft).

Additionally, the appropriate Colorado recordation forms for the newly recorded sites (5LA10396, 5LA10433, 5LA10503, 5LA10536, 5LA10539, 5LA10563, and 5LA10640) are attached as Enclosure 2. Fort Carson requests your concurrence with our determination that these sites are eligible for inclusion in the National Register of Historic Places.

If you have any questions or require additional information, please contact Ms. Pamela Cowen, Cultural Resources Program Manager, at the above address, at (719) 526-3806 or FAX (719) 526-2305, or by email at pamela.cowen@carson.army.mil.

Sincerely,

Thomas L. Warren
Director, Environmental
Compliance and Management

Enclosures

DETERMINATION OF ADVERSE EFFECT AND CONCURRENCE WITH PROPOSED MITIGATION PLAN FOR 5LA02356, 5LA05820, 5LA05829, 5LA06553, 5LA09284, 5LA10396, 5LA10433, 5LA10503, 5LA10536, 5LA10539, 5LA10563, and 5LA10640.

Concur _____ Date Jan. 20, 2005
Colorado State Historic Preservation Officer

DETERMINATION OF ELIGIBILITY: 5LA10396, 5LA10433, 5LA10503, 5LA10536, 5LA10539, 5LA10563, and 5LA10640 ARE ELIGIBLE FOR INCLUSION IN THE NATIONAL REGISTER OF HISTORIC PLACES. 5LA2356, 5LA9284

Concur _____ Date Jan. 20, 2005
Colorado State Historic Preservation Officer

FINDING OF NO SIGNIFICANT IMPACT

CONSTRUCTION AND OPERATION OF A LIVE FIRE, MANEUVER RANGE AT PINON CANYON MANEUVER SITE, COLORADO

1. **Description of Action.** The 7th Infantry Division and Fort Carson, Colorado is proposing to construct and operate a Live Fire, Maneuver Range to conduct its military mission to meet evolving Army training standards. These facilities would be located in the north-central portion of Pinon Canyon Maneuver Site (PCMS). The Proposed Action is the preferred alternative.

   Construction and the beginning of range operations are planned for 2005. The range (20,900 acres, including the surface danger zone) would provide maneuver live fire training in an urban atmosphere or convoy attack scenario, including dangers presented by improvised explosive devices that could be hidden in cars or in debris along the road. This would occur in a teamwork situation while the troops are on the move, in vehicles or on foot, rather than at a static, small arms range where a soldier stands in one place and fires at a target. The "urban" element would be provided by emplacing removable building facades and targets along the route inside a designated range footprint. This range would use small arms through 81 mm mortar, non-explosive ammunition. All activities, including the surface danger zone, would be confined to PCMS.

   The No Action Alternative was considered in the environmental consequences analysis. There would be no construction or operation of the range under the No Action Alternative. This alternative provides a basis of comparison for the Proposed Action and also addresses issues of concern by avoiding or minimizing effects associated with the Proposed Action.

   Alternative F, siting the range on the location used for static small arms qualification ranges, was also considered in the environmental consequences analysis. This alternative was not selected due to scheduling conflicts between small arms qualification ranges and the Live Fire, Maneuver Range as well as a more restricted area in which to maneuver and fire compared to the Proposed Action site.

2. **Anticipated Environmental Effects**. No significant adverse environmental or socio-economic impacts are anticipated. There would be no effects on geology, water resources, cultural resources, safety of children, environmental justice, or socio-economics. There would be temporary effects on air quality during construction and minor effects on soil and flora and fauna, particularly on construction sites. There would be no effects on federally-listed species and minimal effects on wetlands. There would be no significant noise impacts off PCMS. Lead would be deposited downrange, but it would not migrate off the installation. Outdoor recreation would not be permitted in the surface danger area during range operations.

3. **Conclusions**. Based on a review of the information contained in the environmental assessment (EA) for the Proposed Action, it is concluded that construction and operation of a Live Fire, Maneuver Range on PCMS is not a major federal action that would significantly affect the quality of the environment within the meaning of Section 102(2)(c) of the

National Environmental Policy Act of 1969, as amended. Accordingly, the preparation of an Environmental Impact Statement for this Proposed Action is not required.

4. **Point of Contact**. All interested agencies, groups, and individuals are invited to submit written comments to the Directorate of Environmental Compliance and Management, 1636 Elwell Street, Building 6236, Fort Carson, CO 80913-4000, by sending a telefax to (719) 526-6206, or by e-mail to debi.owings@us.army.mil within 30 days after publication of this notice. The EA is available for public examination, upon request, by writing to the above address or by calling (719) 526-4666. The EA is also available for review at the following locations: Colorado Springs, Penrose Public Library; Pueblo, Pueblo City-County Library; Trinidad, Carnegie Public Library, La Junta, Woodruff Memorial Library, Rocky Ford, Rocky Ford City Library; Walsenburg, Huerfano County Public Library, and the PCMS Main Administration Building

Approved By:

MICHAEL RESTY, JR.
COL, CM
Garrison Commander
7th Infantry Division and Fort Carson
Fort Carson, Colorado

Date 5/4/05